DOCUMENT RESUME

ED 475 002 UD 035 438

AUTHOR	Hartman, Bonnie, Ed.; Rohland, Mark, Ed.
TITLE	The CEIC Review, 2001. A Catalyst for Merging Research, Policy, and Practice.
INSTITUTION	Temple Univ., Philadelphia, PA. National Education Center on Education in the Inner Cities.
PUB DATE	2001-10-00
NOTE	85p.
AVAILABLE FROM	National Center on Education in the Inner Cities, Center for Research in Human Development and Education, Temple University, 1301 Cecil B. Moore Avenue, Philadelphia, PA 19122-6091. Tel: 215-204-3000; Web site: http://www.temple.edu/ LSS/ceicrevlist.htm.
PUB TYPE	Collected Works - Serials (022)
JOURNAL CIT	CEIC Review; v10 n7-9 2001
EDRS PRICE	EDRS Price MF01/PC04 Plus Postage.
DESCRIPTORS	Academic Achievement; Career Academies; *Class Size; Economic Factors; *Education Work Relationship; Educational Policy; Educational Quality; Elementary Secondary Education; Equal Education; Federal Programs; Foreign Countries; Governance; Grade Repetition; Higher Education; Labor Market; Minority Groups; Outcomes of Education; School Effectiveness; Special Education; State Programs; Taxes; Teacher Competencies; Technical Education; *Urban Schools
IDENTIFIERS	*Class Size Reduction; Learning Communities; New York (New York); Pennsylvania (Philadelphia); Wisconsin; Work Based Learning

ABSTRACT

These three volumes contain articles related to (1) improving educational productivity (lessons from economics); (2) school-to-work (STW); and (3) reduced class size, offering recommendations from national invitational conferences. Topics include making schools work; tax revolts and school performance; market pressure and the impact on performance; state aid and education outcomes; economics of grade retention; enhancing teacher quality to improve student achievement; measuring school efficiency; examining school-level expenditures and school performance in New York City; the relationship between student performance and school expenditures; the nexus between educational inputs, distribution of performance, and incentives; problems in estimating school effects; STW accomplishments and problems; youth labor market in the 1990s; STW governance; school-employer partnerships and student outcomes; developing work-based learning pedagogies; the impact of STW on minority students; career academies and high school reform around the STW movement; international perspectives on vocational/technical education; class size evaluation lessons; evaluation of the federal Class-Size Reduction Program; evaluating the effects of statewide class-size reduction initiatives; balancing breadth and depth of content coverage; class size reductions and special education referrals and placements; lessons for teachers; outcomes of small classes; professional development and support needs related to class size reduction; and students' sense of community. (SM)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 475 002

The CEIC Review
A Catalyst for Merging Research, Policy, and Practice

Volume 10, Nos. 7-9
2001

Bonnie Hartman and Mark Rohland, Editors

National Research Center on Education in the Inner City
Center for Research in Human Development and Education
Temple University

UD 035 438

BEST COPY AVAILABLE

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

The National Center on
Education in the Inner Cities

The CEIC
REVIEW
A catalyst for merging research, policy, and practice.

Volume 10 • Number 7 • September 2001

Making Schools Work

Recommendations from a National Invitational Conference on Improving Educational Productivity: Lessons from Economics

David H. Monk, Pennsylvania State University; Herbert J. Walberg, University of Chicago at Illinois; and Margaret C. Wang, Temple University

Educational researchers and policymakers, traditionally concerned with promoting access to opportunity and equity, have in the past decade shown growing interest in productivity, motivated by the increasing concern for accountability and efficiency in the nation's school systems. Building on earlier work investigating the relation between educational inputs and outcomes, a new generation of economists is applying insights and techniques to further our understanding of what makes schools more productive and efficient.

Economists and Educators Collaborating

To bring together these new economists of education, showcase their work, and facilitate exploration of its implications for practice, a national invitational conference was conceived. Cosponsored by the Laboratory for Student Success and the National Center on Education in the Inner Cities, both at Temple University's Center for Research in Human Development and Education, this conference on "Improving Educational Productivity: Lessons from Economics" was held Nov. 27-28 2000 in Washington, DC.

An important goal of the conference was bridging the divide that can exist between the worlds of economics and educational policy. An economic understanding of the impact of resources on student success is important to school efficiency, yet many educators remain wary of economists as outsiders with limited knowledge of schools. Thus the scholars who contributed commissioned papers to the conference were encouraged to think of policymakers at all levels as the intended audience for their reports. To help policymakers in their decisions, the papers were intended to explain and interpret the latest, most promising research on educational productivity and efficiency.

These papers (summarized here by the editors and recently published by Information Age Publishing) presented overviews, critiques, and findings with rich implications for strengthening our schools. They approached the overarching issues of productivity and efficiency in various ways. The first three papers focused on a series of external influences on the operation of public schools, including changes in taxpayer support of education (Downes and Figlio), market pressures from vouchers and private schools (Goldhaber), and alternative funding distribution mechanisms in response to litigation (Murray). The next four papers concerned relationships between productivity and reforms in schooling practice. Productivity research on grade retention (Eide), teacher quality (Loeb), school-level efficiency (Schwartz and Stiefel), and internal resource-allocation practices (Rubenstein and Iatarola) was analyzed with an emphasis on implications for policy. The final set of papers reported on insights from new approaches to the study of educational productivity, including the need to consider individual differences among students (Taylor), the difficulties resulting from looking exclusively at average achievement gains (Hussain), and the estimation of school effects using sophisticated econometric tools (Ludwig). The conference participants included practitioners, policymakers, and researchers from multiple disciplines. The conference design facilitated a dialogue among these groups and gave rise to recommendations for improved research and applications to policy and practice.

Next-Step Recommendations

The participants also worked in small groups with the conference leaders to develop recommendations for next steps towards improving educational productivity. Recommendations were

(**Making**, continued on p. 22)

The National Center on Education in the Inner Cities is a unit in the Temple University Center for Research in Human Development and Education, an interdisciplinary center devoted to fostering healthy developmental and educational success of children and families in this nation's urban communities. Inquiries about the work of the Center should be sent to Information Services, CRHDE, Temple University, 1301 Cecil B. Moore Avenue, Philadelphia, PA 19122-6091. Copyright © 2001

Tax Revolts and School Performance

Thomas Downes, Tufts University and David Figlio, University of Florida and National Bureau of Economic Research

The 1978 passage of Proposition 13 limiting property taxes in California stimulated a tax revolt in America that was meant to reduce waste in government services, including public schools. Many states and localities subsequently passed both tax and government spending limits in a fiscal-reform movement that peaked in the early 1980s but continues today. Although these restrictions were of heterogeneous scope and severity, the similarity of effects across states has seemed more important than have differences from state to state, as researchers over the past 20 years reached consensus that the limits significantly reduced public services in the affected areas.

However, as proponents have argued, reduction in service quantity and quality does not necessarily follow from reduction in revenue or spending. Service can improve after limits are imposed if waste is reduced and if resources are used more efficiently. For schools in particular, there seems no reason to believe that reduced spending would affect the quality of student performance, since research has shown no effect on student performance with increased spending.

Nevertheless, because research has also shown that tax limits can have extrafinancial effects, such as reduction in community homogeneity, that may indirectly influence public services like schools, economic models that posit simple causal relations between fiscal limits and public-sector changes seem unsatisfactory. In light of investigation of the complex effects of fiscal limits on public-school student performance, this study focuses on that public-sector outcome and proposes a series of potential explanations for the relation found in the literature between fiscal limits and negative student performance. The authors draw analogies between the tax revolt of the recent past and the current accountability movement.

Effects of Tax and Spending Limits on Student Performance

Despite the long delay between implementation of the major statewide tax and spending restrictions and investigation of their influence on student performance, early research on the limits' general effects indicated reductions in the quality of school services, like California's cuts in service employees and in the diversity of course offerings. The first research on the performance effects of tax limits, conducted in 1992 in California, showed no changes in performance on achievement tests, but since the state also imposed relevant financial reforms, no general conclusions could be drawn from this study.

More recent research has examined nationwide effects, using a cross section of student data from the National Educational Longitudinal Survey (NELS). It was found that the scores on achievement tests of 10th graders were significantly lower in states faced with either revenue or expenditure limits, but the study could not rule out the possibility that sorting and unobserved tastes for education caused the test-score differences and the passage of limits. Another investigation of Chicago suburban districts faced with property-tax restrictions eliminated that problem and showed modest performance effects: slowed growth in the performance of third graders on achievement tests in mathematics. This work was limited by the possible exceptionality of the districts studied and by the lack of long-term data.

Building on insight from this research, the present study's authors recently examined effects of limits on performance more longitudinally, comparing public-school performance data from the National Longitudinal Study of the High School Class of 1972 and from the 1992 (senior-year) follow-up of the NELS. This comparison allowed long-term analysis of limits' effects, and further comparison of states with limits to those without afforded a control group. The authors' analysis found that local fiscal limits correlated significantly with reduced performance on standardized tests of math skills. Reductions were from 1% to 7%, depending on model specification. However, no evidence of reduced reading-skill performance was found.

Most research on the effects of fiscal limits has focused on students who remain in public schools. However, recent work has shown that the limits affect enrollment, with public schools' share of the potential student population dropping where the most initial cuts are needed after a tax restriction as a result of both dropouts and private-school enrollment shifts. Thus research should also focus on the effects of limits on private-school performance. Using methodology similar to their public-school study, the present authors have found modest evidence of negative effects of tax limits on private-school test scores. It may be that those curtailments lower the quality of private-school achievement because of lower public-school competition, higher private-school selection by less capable students after the imposition of limits, and related effects of lower peer competition.

On balance, evidence on the impact of limits on performance is more compelling for mean performance than for cross-district distribution. Performance does deteriorate more rapidly in economically disadvantaged areas, though frequently not at statistically significant levels. While further investigation is needed into the dependence of the effects of limits on conditions in particular districts, research increasingly suggests that tax and spending limits lower academic achievement.

Explaining Effects of Limits on Performance

Since the relationship between increased spending and improved student outcomes is weak, it seems surprising that spending limits affect outcomes. Increased spending apparently fails to affect achievement because additional resources are not used efficiently. Even allocations that are meant to help students directly, such as hiring teachers to reduce class size, show little influence. Moreover, allocations often go to administrative improvements that affect students only indirectly. Or allocations go to increase the salaries of experienced teachers, with whom performance benefits are not typically associated, not to hiring highly qualified new teachers who could be expected to improve outcomes.

Yet decreased spending does not show symmetrical impact on allocation. Whereas spending increases tend to accrue to administration, decreases tend to be borne by instruction. If instructional spending matters at all (which is still an open question), then reducing spending would more directly affect students than increasing it would. Even less funding would be available for hiring better teachers, and that would lead to changes in the instructional labor market that would be deleterious to student outcomes. Research has indeed associated tax limits with reduced average qualifications of new teachers, which in some cases (selectivity of undergraduate institution, subject-matter expertise) influence student performance negatively. Research has also shown that districts subject to tax limitations cut the salaries of starting teachers while maintaining those of experienced ones, making it likely that the schools will attract less qualified applicants.

Another cause of the negative effects of limits lies in administrative inefficiency. Neither tax nor spending limits typically stipulate explicit incentives for eliminating administrative waste. Therefore, research shows, some administrators strategically allow high budgets and technical inefficiencies to continue. That encourages communities to override limits in response to continued declines in student performance that stem from administrative inaction or instructional cuts. Evidence that districts that are bound by limits reduce instruction but not administration supports the view that administrative waste contributes to the negative effects of limits.

Admittedly, administration is not favored over instruction in all districts. Sometimes under local limits, competitive pressure from unaffected districts causes affected ones to sustain instructional expenses and to cut administrative waste. Related research has shown that competition for resources among urban public schools tends to increase their efficiency.

Moreover, increased community heterogeneity may account for part of the negative influence of limits. Since educating a more socioeconomically and academically heterogeneous community is more costly than educating a homogenous one, fiscal constraints in such communities may increase the likelihood of reduced outcomes. Further, where fiscal limits lead some students, especially those with the highest ability and socioeconomic status, to move to the private sector, as studies suggest they do, performance levels may fall, and educating the remaining public-sector students may be even costlier.

While these causal mechanisms for the negative effects of limits on student achievement are not comprehensive, they explain why performance should drop more dramatically with fiscal reduction than it would rise with fiscal expansion. Thus the intent of voters who favor reductions in property taxes, to enjoy a financial benefit without facing a less effective public-school system, seems unrealized, especially since tax reductions fail to specify how money is to be spent or to provide otherwise for eliminating inefficiencies in school systems. That the most productive component of the system, the instructional one, is the most susceptible to reduced spending exacerbates inefficiencies and increases the likelihood that the aims of fiscal limits will not be achieved.

Conclusion

Although evidence suggests that fiscal limits reduce student performance, it remains debatable whether such limits are good public policy, since more comprehensive research on their costs and benefits remains to be conducted. The tax revolt does make it clear, however, that educational reforms can have unintended consequences. If this is true for fiscal limits, it may also be true for an important current trend in school reform: increasing school-level accountability through linking student test scores to public evaluation of schools. This trend has been inspired by the notion that greater public accountability motivates schools to appear better and thus retain students.

However, since the experiments with limits show that administrators do not always allocate resources effectively, increased accountability will not necessarily lead to greater efficiency. Although resources are likely to be allocated to productive uses in an atmosphere of accountability, administrators could still siphon resources from productive uses to areas believed to improve test scores. However, these areas may not be those most conducive to increasing the long-term productivity of the schools. Thus it is not obvious from economic theory that increasing accountability increases efficiency. Just as in the case of the impact of fiscal limitations, the impact of accountability on efficiency remains ultimately an empirical question.

⌘

The Interface Between Public and Private Schooling:

Market Pressure and the Impact on Performance

Dan Goldhaber, Urban Institute in the Education Policy Center

Debate about school choice and educational vouchers has centered on vouchers' effects on student outcomes. However, too often debate has overlooked the determining role of policy choices or results of voucher experiments. Also, complex school–market interaction may make outcomes impossible to predict before broad voucher implementation. This study examines theory and evidence for voucher policies, assessing their feasibility. It describes arguments underlying advocacy of school choice, research on competition in our mostly voucher-free educational system, public- and private-school differences, influences of school type on voucher experiments, and voucher policies' likely impact.

Theoretical Arguments for Choice

MARKET EFFICIENCY

Advocates believe more school choice will allow better student–school fit than public education. But others maintain better matching will not improve performance unless financial pressures improve educational practices. A voucher-based educational market linking funding to pupil counts based on parental choice could motivate improvement, especially in inefficient public schools, eliminating allocations unrelated to student achievement. This market model of school choice assumes an efficient market of equivalent products, buyers and sellers of comparable size, mobile market entry and exit, and perfect knowledge among market participants. Although no market is entirely efficient, this model's proponents believe vouchers would increase competition and yield more efficient achievement-to-cost ratios.

THE MARKET AND PUBLIC SCHOOLS

Public-school advocates argue it is inappropriate to view public schools in a market context. They note that beyond individual instructional effects, public schools influence social cohesion, with some research suggesting more school choice would increase racial and socioeconomic segregation, thus decreasing social cohesion. But established housing patterns already relatively segregate schools today. Choice proponents maintain vouchers could break the school–housing link. This claim cannot yet be evaluated, because broad voucher systems have not yet been implemented. Another argument against vouchers has been that competition would result in fewer resources for the most needy students; however, little evidence exists on how vouchers might impact spending on public schools or distribution of spending.

Another reason to be skeptical of the market view of schools is the crucial role information plays in market efficiency. Inadequate parental information about schools' quality may result in poor choices. Many schools, though, are providing more information in public report cards. Studies show positive relations between parental choice and school quality, suggesting parents make academically beneficial decisions. This relationship seems strongly related to the school's or community's socioeconomic status. Because of unavoidable inequalities in school and student achievement, even perfect parental information and school access cannot guarantee equal distribution of gains. Whatever the market conditions, unless families base choices on academic quality, not features like proximity and cocurricular programs, increased competition may not boost achievement.

Competition's Impact on Schools

Since theory alone cannot determine vouchers' feasibility, evidence on school choice should be considered. Of many competing forms of school choice, open enrollment within and between public school districts and private–public school competition parallel most closely the likely effects of voucher programs. Research on these choices has produced mixed results.

PUBLIC-SECTOR COMPETITION

A study of open enrollment in Chicago, where half of high-school students chose to change schools, showed changing did not significantly raise changers' graduation rates or harm those left behind, except in the case of Chicago's "Career Academies," where those attending experienced small benefits. These results suggest better school–student fit can improve outcomes. Since such intradistrict choice does not affect revenue, it may not stimulate school improvement; thus interdistrict choice, threatening student loss, seems a better model of competitive educational markets. Anecdotal evidence indicates interdistrict choice leads to innovations to attract and keep students, even when few actually move. Moreover, studies of interdistrict competition with virtual choice due to large numbers of area districts showed competition led to improved school quality and student performance.

PUBLIC–PRIVATE COMPETITION

Since an area's private and public schools compete, a market-based argument suggests competition should improve local student outcomes. Though one study found increased private-school enrollment led not to greater public-school achievement but greater resource investment, this finding seems ungeneralizable. Given public-school funding's complexities, including possible reciprocal effects of private-school enrollment on area revenues, simple correlation between private-school enrollment and public-school funding cannot be predicted. Factors like parental preference, community affluence and educational demand, and private-school establishment where public ones are weak all need accounting for. By considering effects of public-school quality and community features on private-school supply, researchers have found competition from private schools benefits public-school students' performance. Gains are modest, with public-school test scores and graduation rates rising less than 5%, implying vouchers would not significantly elevate public-school efficiency unless students found private schools much more attractive. Differences between these school sectors need further scrutiny.

Public–Private School Differences

Institutional Differences

Private schools generally provide more administrative freedom and curricular rigor than bureaucratic, highly tracked public schools. Private schools also foster the effective teachers crucial to student achievement. Although public schools pay teachers more, they often hire weaker candidates and value their aptitudes less than private schools paying in greater accordance with market conditions and proven abilities. Public schools' uniform salary schedules may discourage talented candidates and fail to motivate excellence, while private schools' performance-based compensation and pay differentials may motivate achievement. Teacher characteristics like enthusiasm may account for the effectiveness of these compensation differences, but so may student characteristics. Private-school faculty may trade salary security for more advantaged pupils. Student advantages may also shape policy and practical differences between the two sectors.

Student Outcome Differences

Comparing test-score differences between the sectors' students has yielded mixed results. Recent evidence showed positive private-school effects, especially for urban minority pupils, but the largely nonexperimental data did not rule out alternative causes of improvement. But even if private schools' student achievement is not clearly superior, their educational cost may be. Private-school education, especially Catholic, can cost 50% less per pupil. If achievement is equivalent and these costs are accurate, then private schools are more cost-effective. However, these estimates ignore subsidies masking additional costs. Also, private schools often enroll advantaged children, who are inherently less costly to educate. Such student differences and unobservables like parental motivation to support education hinder valid comparison of the two sectors' efficiency in producing achievement.

Voucher Experiments

Since educational experiments use random assignments and control groups to eliminate the need to account for background and unobservables, they are more comprehensible and useful in gaining public support than other means. Though political constraints have limited voucher experiments, recently several providing data on school-sector differences have been privately funded, targeting low-income urban students in various grades. Students were randomly chosen by elective lottery to receive modest vouchers. Post voucher surveys showed attending private school benefited African Americans. In two years, their test scores narrowed the national Black–White achievement gap by up to one half. These effects were large compared to other interventions like class size reduction.

However, assessments did not control for peer effects, so improvement may have been due to student, not school, quality. Also, missing effects for non-African Americans remained unexplained, and attrition may have biased results towards better pupils. Finally, imperfect randomization, possible experimental-setting influences, and failure to account for varying school quality in both sectors argue caution in generalizing from the experiments' results.

Voucher Policies' Likely Impact

While voucher experiments furnish evidence favoring general voucher implementation, the possibility of peer effects warns that a general policy rendering both school sectors demographically similar might eliminate a key ingredient that makes private institutions motivate change. Further, nonexperimental evidence, though inconclusive, is important for predicting voucher-policy effects. The evidence of unobservables and other nonmarket explanations of achievement gain indicates optimizing these might cause improvements more efficiently than costly voucher plans. It is also unclear whether increased private-education demand would be met by better schools. Economic theory suggests that the most efficient private schools are now thriving in high-demand markets and that additional schools may be weaker than many public schools, eliminating incentives for change.

Another unknown is the voucher plans' impact on public-school funding. Again, competition might produce public education providing less social support than the current system. As voucher plans change student distribution across schools, affecting social cohesion, trade-offs are likely, as schools sacrifice qualities like diversity for achievement. Voucher programs could be designed to motivate public-school support through taxation, but the effects of such incentives are unknown, as are the effects of voucher plans' administrative costs.

Conclusions

Although results are mixed, evidence on school competition supports the notion that it improves student outcomes. Despite significant differences between public and private schools, especially in teacher compensation and student outcomes, it is unclear whether schools or students account for differences. Voucher experiments show a positive private-sector effect. But existing theory and evidence suggest future voucher policies' success depends on policy details like private-school requirements and the size, eligibility, and financing mechanism of vouchers. Though cautious optimism is warranted, socioeconomic effects of widespread voucher implementation are uncertain.

⌘

State Aid and Education Outcomes

Sheila E. Murray, RAND Corporation

Traditionally, financial control of American public schools has been local. Although states have shared in costs, their traditional major role has been to monitor curriculum, evaluation, and standards. However, since the landmark 1971 case, *Serrano v. Priest*, in California, states have assumed a larger, redistributive role in educational finance. The resulting conflicts over loss of community control have sometimes caused the withdrawal of parental and political support from public education. This report describes research on the increasing role of states in public-school finance, examining ways of achieving and evaluating funding equity as well as the impact of states' efforts on spending and on student outcomes.

Achieving Equity

Equity Programs

It has long been argued that local funding of public schools is unfair, since tax-base differences across districts are large. As of 1999, opponents of local funding had argued cases in state supreme courts of 43 states; educational finance reform had been mandated in 19 states. States use many programs to fund equalization efforts. The flat-grant programs typical before the 1970s, through which districts receive funds independent of district expenditures, have become less common as states have become more concerned with addressing inequality across districts. Full state education funding is also uncommon, as most localities oppose so much state control. Most common are equalization grant programs, divisible into two categories.

First, *foundation grants* are the most popular programs, used by 40 states. They are designed to guarantee that each student in a state receives a minimum of funding. Funding is calculated on a minimum foundation level and a state-established minimum uniform tax rate. State aid fills the gap between resources needed according to state measures and a district's ability to meet that need. Adjustments are made to reflect cost differences across districts for student education and to allow total spending in some districts receiving aid to exceed the minimum foundation level.

Second, *district power equalization programs* (DPEs) work to equalize on the basis of local spending, not minimum need. Under DPEs, states calculate aid on the basis of the difference between a districts' tax base per student and a tax-base rate established by the state. When a district's tax-base rate exceeds the state's, the state does not recover funds from the district to fund less endowed districts (and theoretically to make the program self-financing). Instead, programs are constructed so that even wealthy districts receive some state aid.

Evaluating Equity Programs

The definition of equity determines the success of an equity program. If equity means equal spending throughout a state, no plan achieves equity, and only a fully state-controlled program could. If equity means that districts with the same tax rate can spend the same amount on education, DPEs, based on tax rates, seem the best means to equity. And if equity means wealth neutrality, so that communities spending more would not necessarily be the wealthiest ones, DPEs also seem to lead to equity, since they disconnect the educational resources of a district from the district's wealth. However, DPEs do not benefit all districts needing more resources. For instance, some districts with low income but with high taxable property wealth (due perhaps to an elderly population) would miss out on needed aid, as would cities with much taxable commercial property but a high number of low-income students.

Finally, if equity means that all students achieve a minimum educational level, outcomes, not inputs, become the focus, and inequitable funding might be needed to achieve equity in districts with many disadvantaged students. This definition of equity seems to favor foundation grants, but most states have not calculated outcomes into their foundation financing. Since accounting for individual students' needs is prohibitively expensive, states must build finance systems that provide districts, schools, and teachers with resources and inducements to tailor instruction to student needs.

Statistical approaches to calculating links between financing, instructional delivery, and outcomes are being developed. One approach fixes outcomes at an agreed level and then uses student characteristics, instructional-factor prices, and statistically determined cost functions for a district to estimate the amount the district needs in order to provide adequate education. However, such approaches are flawed by their poor ability to estimate how much more spending is needed in low-income districts to achieve adequacy.

Nonstatistical approaches that attempt better links between financing and outcomes include using successful districts as benchmarks for funding, constructing delivery models, and implementing commercial whole-school designs. Yet these strategies make outcomes no more predictable, and consensus is low on what outcomes should be. Today's high-stakes testing trend, for instance, has been criticized for narrowing curricula and distorting scores.

A final approach to achieving outcome equity through efficient funding is to adjust funding for district cost differences on the basis of measures like the consumer price index. But such adjustments fail to account for inflation or for specific community costs. In reality, most funding decisions still must rely on political bargaining, and substantive redistribution in favor of equity, however that is defined, only occurs through litigation.

The Impact on Spending

Court-ordered state finance reform has generated more equal spending across districts, mainly through directing new state funds to low-spending districts. This change has affected resource use. In the past few decades, state funding for students grew markedly. From 1972 to 1992, state contributions to public education grew from 38.3% to 49.3%. Differences between the highest and lowest student spending narrowed somewhat in that time. Moreover, at the end of the period, unequal spending between states was much larger than within them, and more than 90% of the reduction during the two decades was due to reduced inequality between states.

California, the first state to experience court-ordered reform, illustrates the impact of spending reform more particularly. Research has shown that increased state educational financing in California has led to reduction in overall spending, with about half the decline due to the 1971 *Serrano* decision. The effects on educational spending of 1978's Proposition 13, which limited property tax rates, have been hard to separate from the effects of *Serrano*, since the proposition limited local educational resources. Indeed, some have argued that *Serrano* led to Proposition 13, as taxpayers found educational returns for their taxes insufficient after *Serrano*. Nevertheless, since court-ordered educational reform led to tax limits in only three other states, this causal link seems doubtful.

Kentucky also illustrates the impact of court reform. It saw dramatic local educational spending disparities by the 1980s between wealthier and poorer districts. State funding, which was based on the number of classrooms, not on the number of students, exacerbated this difference. In 1989, the state supreme court instructed the state to create a more equitable system. The result, the1990 Kentucky Education Reform Act, raised the foundation grant, adjusted equalization grants and property assessments, and changed the basis for aid calculations from classrooms to students. By 1992, funding to the poorest districts had grown by over two thirds, while funding increases to wealthier districts were limited.

Further research has shown that reform litigation increases educational spending significantly, although increased state funding can decrease overall spending on education, as in California. Moreover, using econometric modeling to assess the effects of state spending reform over time, the author and her co-workers have concluded that court-mandated reforms reduced inequality within states by percentages ranging from 16% to 38%; that spending rose by 11% in the lowest spending districts, sometimes with state revenues replacing local, providing tax relief; and that increased educational spending was supported by higher taxes. Gains persisted, and benefits went consistently to those districts with lower levels of spending.

Results vary from state to state, but the author's research indicates that districts have directed about 40% of their additional resources to hiring teachers and raising their salaries. Poorer districts raised teacher numbers and salaries most. Instruction probably accounts for most of the increased expenditures, but research on funds use is hampered by a lack of detailed national data on expenditures like textbooks and computers.

The Impact on Educational Outcomes

The many studies that link educational finance reform with outcomes have been inconclusive, showing little clear impact. Confusing the matter is the link between higher outcomes on the SAT and spending inequality, which implies that we might maximize average outcomes by spending much on a few students, those likely to excel on the SAT, and little on the rest. Another way to examine the impact of spending on performance is to examine the outcomes of court-mandated reform, which capture other causes of change, such as improvements in instruction. Research so far, using both California and national data, has shown that court-mandated reforms do not lead to significant changes in student performance.

One study attempted to account for the selectivity effects of scores on the SAT, which tends to be taken by students who come from wealthier families and who rank highly in their class. The study concluded that finance reforms modestly equalized the test scores of students of different socioeconomic backgrounds. During the 1980s, the gap in SAT scores closed by about 10 points between children of more and less educated parents in 12 court-mandated reform states.

Conclusion

The shift toward state educational financing in the past few decades has led to significant decreases in educational spending. Each state's finance system is unique, and its response to litigation related to education is different. However, research suggests that, on balance, court-ordered reforms have had their intended effects, reducing disparities in spending across districts through directing new state funds to low-spending and low-income districts. Additionally, preliminary evidence suggests that new resources have found their way to classrooms and that student achievement has not been harmed by court reforms.

⌘

The Economics of Grade Retention

Eric R. Eide, Brigham Young University

Grade retention is a widely contested issue in American education reform. Designed to improve students' academic skills and to allow them to mature, retention has been praised as an antidote to the social promotion of students who lack mastery of essential skills. However, empirical results on retention's benefits are inconclusive, failing to justify widespread implementation. The extent to which the policy improves student outcomes needs further economic assessment. This study reviews the issue's background, discusses the costs and benefits of retention, examines previous methods of estimating its effectiveness, and suggests a promising econometric estimation method.

Background

Repeating a grade is consistently associated with being male, minority, and poor. Students who are retained are often emotionally immature and younger than their classmates. Retention is common: An estimated 13% of youth aged 16 to 24 have repeated a grade, and 1% of K–12 students are retained annually. While some evidence indicates that retention improves academic achievement, self-esteem, and other outcomes, more evidence suggests that repeating a grade can cause low self-esteem, poor academic performance, and dropping out. As this study suggests, it is possible that the variety of data and analytical tools accounts for the preponderance of negative evidence, and perhaps more sophisticated analysis would reveal benefits more clearly.

Economic Effects of Retention

Costs

Researchers typically focus on the benefits of retention. But they overlook the costs of retention, with the exception of emotional costs and the labor-market penalties of dropping out because of retention. For thorough analysis of the effects of retention, three types of cost should be considered.

First, *the direct cost to the taxpayer* is large, estimated at $2.6 billion annually at a conservative 1% annual retention rate. Teacher training and supplemental instruction for retained students are also costly.

Second, retained students potentially lose a year's income because of their *delayed labor-market entry*. If retained students graduate from high school and earn as much as other graduates, they may lose over $30,000 for the retention year. Furthermore, if retained students drop out, they may gain earnings by early market entry, but these additional earnings may be offset by the lower lifetime income associated with failure to complete high school. Of course, if the retention is early and related to immaturity, such substantial economic costs may be compensated for by further education and job achievement.

Third, *psychological costs*, such as low self-esteem, may be either causes or effects of retention. These need careful consideration, given the mixed evidence on whether retention allows time for emotional maturation or inflicts emotional harm by creating or reinforcing a negative academic self-image.

BENEFITS AND THE DECISION TO RETAIN

In order for the measure to work, the benefits of grade retention must outweigh its costs, but little evidence exists that they do. Few have found that retention improves achievement, maturity, or post-school earnings; any advantages found tend to diminish with time. Even if better measures developed through future research show more benefits, the quality of the decision to retain on the basis of costs and benefits needs to be considered; an economic model may work best to that end.

The decision to retain is usually made by teachers and principals with parents, who may have the final say. The school's objective is always the same: to improve student performance. However, an economic model accounts for the parents' objective: that benefits in performance and expected earnings trump costs of deferred market entry and psychological damage. Since parents know good performance in a grade predicts success in later grades, they know their children's economic future depends most on performance in earlier grades; thus they have a greater incentive to retain their children earlier. Analysis of retention effects must account not only for the negative correlation between retaking a grade and later earnings but also for such endogenous—situationally specific—choices that could make that correlation positive.

But although the decision may be privately beneficial, it may be publicly negative, since most children are publicly educated, and parental decisions ignore the public costs of educating retained children another year. Since parents do not bear the full cost of retention, it is likely to have an inefficient outcome. And insofar as teachers decide, the outcome is inefficient in a different way. Since teachers receive no benefits from retention—indeed it costs them extra effort—they have an incentive to promote when they should retain for optimal student performance and future success.

Even when retention is based on a strict academic performance standard theoretically derivable from an objective cost–benefit analysis, the results are inefficient, because the standard originates in the school district, which tends to overpromote, cutting immediate reeducation costs at the expense of long-term outcomes.

10

An economical decision-making policy would have to change the incentive system so that decision makers faced the full costs and benefits of retention.

Estimating the Effects of Retention

Various types of data and analysis have been used to measure the effects of retention. An econometric approach may permit more informed decision making, since it controls for factors not easily observed yet having significant effects.

DATA

Most research on grade retention has used data from school districts. These data yield details about retention policy that are helpful in judging effects, such as the extent of supplemental programs. However, small sample sizes usually limit the generalizability of the results. Researchers have also used national surveys that are limited by their short-term nature or by their lack of data about reasons for retention, supplemental support, or long-term attainment.

ANALYSIS

The diverse analytical tools used partly account for the divergent results of retention research. Several common techniques have inherent advantages and drawbacks. First, qualitative approaches describe the results of student surveys, offering subjective insights not captured in quantitative studies. However, these approaches are clearly limited as grounds for larger inferences.

Second, basic quantitative research reports correlation coefficients between retention and possibly related factors, such as dropping out. However, the absence of controls for other factors makes it impossible to infer causation from correlation. More sophisticated quantitative approaches compare retained and promoted samples having similar characteristics. But those features can account for only some of the influences on retention, and it is likely that some major determinants of the retained group's difference from those promoted remain unanalyzed.

Other comparative approaches are also problematic. While comparisons of retained and first-time students in the same grade can yield results on the value of retention, they cannot determine whether retention itself or another factor like maturation explains the added value. And while comparisons over time of retained students to promoted ones of the same ages eliminate the maturation factor, the exposure of promoted students to more material biases performance matching in their favor. Comparison results can differ on the basis of the comparison used. In one study, same-grade comparisons showed retention positively affecting performance, while same-age comparisons did not. Finally, multiple-regression analysis of both retained and promoted students has been used to control for a large number of observable variables affecting retention. When the sample size is large, this allows for a detailed analysis of retention's possible causes and effects.

None of these approaches, however, accounts for unobservable, usually endogenous, factors that may correlate with the likelihood of retention and with student outcomes. Immaturity, for example, is not typically observed by researchers, so a multiple-regression analysis will measure both retention effects and immaturity, leaving the unobserved factor as a possible cause and biasing the estimation of outcomes. To overcome this difficulty, econometric analysis affords a control technique using instrumental variables. In this method, the researcher identifies a variable that is highly correlated with retention but that is not correlated with unobservable factors influencing an outcome of interest. This instrumental variable can therefore only affect the outcome through its correlation with retention.

The present author has used the instrumental-variable approach to estimate effects of retention on adult earnings by establishing a student's relative age in her class cohort as the instrumental variable. This variable is correlated with retention, because younger students tend to be held back because of immaturity, but arguably the variable has no long-term association with outcomes such as later earnings or with unobservables. Standard multiple-regression analysis showed that retention strongly correlated with both dropping out and lower earnings, but when the instrumental variable controlled for unobservables, in most cases retention had *positive* correlations with outcomes, though these were not statistically significant ones.

This is weak evidence for retention policy, but it suggests that evidence against retention may be flawed. The lack of strong evidence for benefits of retention does not mean that no such benefits exist. Studies using instrumental variables suggest that better estimation may show more advantages, as may further consideration of long-term economic outcomes and of differences in advantages between borderline and weaker sets of retained students.

Conclusions

Although it is not yet clear whether grade retention is beneficial, it seems clear that social promotion, implemented broadly, is inefficient. It confronts neither the school nor the student with short-term costs, but it could lead to the long-term costs of lower student achievement and lower labor-market returns that are like to result from poor academic mastery. A better policy might be to promote students on the basis of economic incentives, so that decision makers face full costs and benefits. Short of comprehensively implemented private education, any market-oriented policy that allows for cost-benefit comparison should lead to more efficient retention decisions and better outcomes for both students and society.

⌘

Teacher Quality:

Its Enhancement and Potential for Improving Pupil Achievement

Susanna Loeb, Stanford University

Because of teacher shortages fueled by increased enrollment and ample opportunities for potential teachers outside education, teacher retention and quality are central to school policy debates today. Incentive policies have been adopted to attract young people into teaching. While intended to boost the quantity of teachers, the policies have also attempted to distribute the quality of teachers equitably by providing incentives for better teachers to choose disadvantaged schools. This article considers the importance of teacher quality for educational policy by examining the effects of teachers on student performance, the distribution of teacher quality and its likely causes, and the role of policy decisions, especially about salaries, in improving quality.

Effects of Teacher Quality on Students

Research has clearly shown that certain measures of teacher quality affect student achievement gains measured by test scores. For instance, one study found a large difference, approximately 50 percentile points, in achievement between students attending classes taught by high-quality teachers for three consecutive years and those taught by low-quality instructors. The quality of teaching had residual effects in later years. The most common method of assessing teacher quality in such studies is the value-added method based on a teacher's history of improving test scores.

This method defines an important component of student success, but it involves potentially troubling features. First, teaching assignments may distort the quality measures, since assignment to accelerated or challenged learners may affect test scores despite a teacher's skills, resulting in over- or underestimation of quality. Second, value-added quality is often measured in environments that give teachers of some students more incentive to focus their instruction on the test. These teachers may produce greater test-score increases in their students, even though they are not of "higher quality" than other teachers. Value-added measures therefore may not represent relative teacher quality accurately and may best be used in combination with other teacher measures.

Less agreement exists on the effects of specific teacher attributes than on overall teacher effects. Some studies examining teachers' years of education and experience, degree level, and certification, for example, did not find that these factors consistently affected pupils' performance. Other studies, however, did find that measurable teacher characteristics, test scores, and college quality, among other things, did affect students' test-score gains. Though some current research comparing value-added quality to teacher attributes found little correlation between them, these results were preliminary. Easily measurable teacher attributes like test achievement may be associated with teachers' influence on students and thus be important for policy decisions.

The Distribution of Teacher Quality

Recent studies have documented substantial differences in teacher qualifications across schools, districts, and regions. In California, for instance, in 10% of elementary schools, over 30% of teachers lacked full certification, while in many schools all teachers were fully certified. Similar disparities appeared in New York: In 5% of schools, fewer than 3% of teachers had a master's degree plus 30 credits, while in another 5%, over 60% of teachers had reached that educational level. Further, differences in teacher characteristics correlate with each other; schools with less qualified teachers in one attribute tend to have teachers less qualified in other ways. Schools are not trading one type of qualification for another but simply hiring less or more qualified teachers generally.

Teacher characteristics are related to school characteristics. Schools in cities, those with high proportions of minority students, and those with many children in poverty tend to have teachers less qualified as measured by certification, degree level, college quality, and test scores. For instance, one third of New York City teachers taking the state's Liberal Arts and Sciences certification test failed it at least once, while only 4.7% outside the city did. Schools with 10% more Black students had teachers who averaged 5.7 points (almost 1 standard deviation) lower on the NTE knowledge exam than teachers at schools with more White students. Within districts, teacher differences similarly correlated with students' minority and poverty proportions.

Causes of Distribution of Teacher Quality

Differences in average teacher qualifications across schools may be due to hiring on the basis of characteristics that we do not have measures of, such as the ability to work with specific groups of children. But it seems unlikely that districts choose to hire teachers with lower qualifications on all of the multiple measures available. Thus, the variation in average qualifications seems unlikely to be the result solely of district preferences for different teacher characteristics.

Another possible cause of distribution by qualifications is hiring efficiency; some districts may recruit less aggressively and offer fewer incentives. This may account for differences across neighboring districts but not for sorting within districts of worse teachers to urban, minority, and poor schools. Some sorting may be due to school politics, as parental complaints about poor teachers can send worse teachers to worse schools. Nevertheless, it seems unlikely that all the sorting observed is due to transfers.

A more likely explanation for teacher quality differences is teacher preference. Research has shown that teachers move to schools with high-achieving, high-socioeconomic-status students when possible. Schools with low-achieving, poor students have difficulty attracting teachers. In some cases, that may not be because teachers are reluctant to teach students at less advantaged schools but because the facilities, supplies, and collegial interactions there are unappealing. Such effects of poor working conditions make it hard to assess the strength of preference as a cause of teacher quality distribution, but in any case it is likely a strong factor in that sorting.

Salary Policy and Teacher Quality Distribution

Though intradistrict salary differences exist too rarely to play a major role in quality sorting, interdistrict starting-salary differences between high- and low-achieving or high- and low-poverty districts are substantial, with the districts with stronger, richer students paying thousands of dollars more, enough to motivate preferential choice. Though starting salaries vary substantially among metropolitan regions of the country, all regions show similar quality differences, so it is likely that cross-regional variations reflect competition from nonteaching opportunities more than differences in cross-regional quality that are related to sorting.

Much research has shown that teachers do respond to salary differences. Individuals are more likely to choose to teach where starting salaries are high in relation to other occupations' wages, and established teachers are more likely to leave teaching when they work in low-salary districts. These findings contradict surveys of teacher choice indicating that motives like the social value of education are more important than salary. However, such findings overlook the common disparity between ideals and action, which makes it possible that salary is a more important factor than teachers admit.

Although high salaries can attract college graduates to teaching, they do not necessarily increase teaching quality. Higher wages will increase the applicant pool, but no direct evidence suggests that better wages draw better teachers disproportionately. The association of higher wages with incentives to work at poorer schools and with competition from alternate occupations also suggests that high pay and quality are not necessarily connected. However, a recent examination of national data since 1960 indicated that states and districts with increased wages saw the most gains in student achievement. This is a sign that high wages can attract teachers and that they may also indirectly improve student performance.

Conclusion

The literature provides evidence that schools differ starkly in the average characteristics of their teachers. It also suggests that teachers respond strongly to both pecuniary and nonpecuniary elements of their jobs. Across districts, in general, there are substantial wage differences. Some wage variation appears to contribute to district differences in alternative wages, but other variation appears to contribute to district differences in average teacher quality. Salary schedules differ little within districts, yet there is large variation in teacher characteristics among schools within the same district. Current salaries can be neither driving nor alleviating these differences. Variation in teacher quality appears to be driven primarily by teachers' preferences for high-achieving, high-socioeconomic-status students or by working conditions in these students' schools. Targeted salary increases and targeted improvements in working conditions in difficult-to-staff schools are needed to draw high-quality teachers to low-performing schools and to alleviate disparities in the quality of the teaching workforce.

Teacher preferences have created disparities in schools' ability to attract and retain high-quality teachers. Teachers, like most workers, value high salaries. However, they also care about the types of students they teach and the environments in which they work. While schools can all pay the same amount for a textbook or a computer, the same teacher will cost different schools different amounts. If schools with unattractive working conditions wish to hire and retain teachers of the same quality as teachers at other schools, they will need to improve these conditions or pay higher salaries.

⌘

Look for the next
issue of the CEIC
Review:

School-to-Work:
Accomplishments,
Problems, and
Prospects

Measuring School Efficiency:

Lessons from Economics, Implications for Practice

Amy Ellen Schwartz and Leanna Stiefel, New York University

Estimating efficiency and productivity in education involves confronting and addressing a host of difficulties in measuring input and output, capturing environmental influences, compensating for data scarcity, and determining causality. Nevertheless, recent improvements in data quality and availability and accompanying advances in statistical methods offer the promise of improved measures of school efficiency and the prospect of identifying the determinants of efficiency across schools and school districts and over time. This report discusses approaches to measuring K–12 efficiency and the relative merits of each. It also explains the complexities of inputs, outputs, and units of analysis before indicating lessons learned.

Measuring Efficiency

Economic efficiency at the school level means that schools produce the most education possible with given resources, use the least expensive combination of resources for any given level of education, and produce the level of education that consumers prefer. Most research has focused on estimating production relationships in education, formulating a production function that measures the maximum output that a given quantity of inputs can produce. This relationship can be statistically estimated and the results used to identify schools' relative efficiency.

Regression estimation of production functions can yield school efficiency measures in two ways. First, school fixed effects can be estimated. These capture the extent to which a school's output systematically exceeds (or falls short of) the output of the average school, given the variations in inputs, students, and their peers' characteristics. Thus, this fixed effect can be viewed as a measure of the relative efficiency of the school in comparison to other schools in the sample. Second, efficiency can be gauged using the estimates of the marginal impact of resources on outputs from the regression along with input prices. These provide insight into whether additional inputs lead efficiently to additional outputs and also into whether greater outputs can be produced by reallocating existing resources.

While most school efficiency work is based upon such regression estimation, three noteworthy alternatives are available and offer a variety of advantages, although these are not without their own drawbacks. Most attractive is that these alternatives incorporate more than one output measure, thus addressing an important limitation of much efficiency research.

First, *cost-function-based efficiency estimates* capture the relative cost of each school's production of education, controlling for different outputs and prices. Second, *property-value-based measures* gauge efficiency on the basis of the extent to which school quality and school taxes are capitalized into property values. This method can yield estimates of the relative importance of, say, test scores and graduation rates for taxpayers. Finally, *data envelopment analysis* (DEA) encompasses programming models that estimate efficiency by constructing a nonstochastic production frontier of greatest efficiency from observed inputs and outputs. With DEA, several outputs can be considered simultaneously, and in addition to distinguishing the relative efficiency of the school, they can provide insight into reductions in inputs that could be accomplished without a reduction in outputs.

Measuring Efficiency in Practice

SPECIFYING INPUTS

Specifying appropriate measures of inputs is critical to efficiency measurement—bias can be introduced either by omitting inputs to production or by including irrelevant variables. Four input categories are relevant to productivity. Some, schools can change; others are relatively immutable.

In the first category are the *purchased physical inputs*, including teachers, supplies, and buildings. While these are the inputs administrators might be most likely to consider in trying to increase output or efficiency, relatively little school-level data on physical inputs are available—typically teacher counts and spending information. Unfortunately, spending reflects both prices and quantities, rather than just quantities, which would be preferable.

Second are *donated physical inputs*: expert and parent volunteers and donated materials like computers or supplies that can improve productivity. While typically welcomed by the school, for a variety of reasons these inputs may involve opportunity costs, and their availability can vary widely from school to school, depending on the resources and characteristics of the school and its community.

The third, varied group is *individual student-specific inputs*, including students, families, and their productivity-relevant qualities. Outcomes depend on factors like student motivation and parental education as well as school factors. Since schools can affect these inputs, for instance English proficiency, by selection processes, separating production efficiency from selection is challenging. It requires detailed, longitudinal data, which are often scarce. Nevertheless, progress in gathering such data is helping researchers disentangle these.

Fourth, *peer and community environment* can determine school efficiency, influencing student characteristics and other inputs. Student performance is likely to be influenced by community, cultural, and economic factors, which must be carefully separated from the influence of the students on each other.

Specifying Outputs

Educational outputs are harder to specify, partly because so much research has relied on models using one output. Despite the need for the multiple-output models mentioned earlier, one-output models are simple, and since alternative outputs are typically highly correlated, some argue that one is sufficient. Test-score achievement is the most common output measure used, largely because scores are available, providing consistent, quantitative measures suitable for this sort of analysis. Notice that different tests may yield different efficiency measures for a given set of schools, depending, for example, upon the subject of the test (e.g., reading versus math), or the scoring (e.g., norm-based versus criterion-based tests).

In addition, if the measures are used in decision making, for example, to reward or recognize performance, different measures may provoke different responses. For instance, reliance upon a measure of the percentage passing a test will provide an incentive to focus efforts on helping weaker students pass, not on improving the performance of the stronger students. The choice between output measures cannot, then, be determined statistically but must reflect the purpose to which the efficiency measures will be put.

Other output measures include graduation and promotion rates, but inconsistent standards governing their definitions render them problematic. A popular and useful formulation of output relies upon value-added output measures, which ideally are measured as the change in a given group's performance between periods. Unfortunately, these data are typically unavailable, so changes across school grades are often used. This is particularly problematic in urban and other areas in which school mobility is high.

Units of Analysis

While schools are one logical unit of analysis, since they have sanctioned responsibility for efficiency, moving below the school level to students or classes is attractive for a variety of reasons. Perhaps most important is that it offers the opportunity to understand differences in education across grades and groups of students. Grade-level analysis may prove more rewarding by avoiding inappropriate comparisons of differing school structures (for instance, K–3 and K–6 elementary units), by identifying efficiency differences across grades, and by discovering the most efficient grade organizations.

Unfortunately, output data will be easier to obtain than input data, since individual student test data are typically recorded, while input flows are rarely tracked within schools. Though trends towards teacher accountability call for class-level analysis, this kind of investigation is currently too costly. Group analysis by race or gender, for which SAT and other data are available, may be useful, but the most challenging and fruitful work may be at the student level.

A rich specification for efficiency estimation can be based on student-level data, which allow detailed accounting for differences in socioeconomic, schooling, and demographic characteristics among students. For instance, sharper analysis of specific effects of peer groups on achievement is possible through the use of a student-level model, and the effects of student heterogeneity can be better measured.

Commentary and Conclusions

Several unresolved issues related to school efficiency remain. First, although richer, more detailed data sets are available for analysis, the quality of the data is unclear. For example, the common measure for poverty, federal school-lunch eligibility, may prove to be an insufficient measure of student poverty, particularly for high-school students. Capital and building statistics, moreover, are incomplete, and yearly test scores may not measure what we mean by performance. Conceptually, the assumption that all schools attempt to maximize productivity and outputs needs further investigation. Output equations may represent only relative, not optimal, productivity, if the sampled schools are off the production frontier.

Further, the extent to which existing analyses are limited by omitted-variable bias remains unresolved. Endogenous relations, such as inverse links between government aid and performance or between class size and performance, may seriously confound the estimation of production functions. Identifying instrumental variables to avoid endogeneity has been difficult. Further, defining an appropriate set of schools for multiyear analyses will require difficult decisions to be made. Omitting schools that exit or enter during the study period may introduce bias, as it may fail to account for school reorganization or redefinitions. Finally, additional research investigating the measurement of school efficiency in theory and in practice, comparing the alternative methods, and assessing the quality and contribution of new data, is critical.

This is an exciting time for research on education efficiency, as better data gathering keeps pace with theoretical advances and increases in computing capacity. The lessons of existing research, however, are important. First, efficiency measures can provide useful and needed insight to guide decisions about school improvement, and second, the employment of multiple measures is preferable to relying on a single, "definitive" measure to capture school performance.

⌘

Examining School-Level Expenditures and School Performance:

The Case of New York City

Ross Rubenstein, Georgia State University; and Patrice Iatarola, Institute for Education and Social Policy, New York University

How school resources affect student outcomes has been the subject of long-standing debate. A common problem in determining how resources help students has been the difficulty identifying how resources reach students, since analysis has focused on school-district data. With improved data collection technology, though, researchers have begun to analyze resource allocation at the school level. As districts decentralize and schools increasingly control their own budgets, meaningful allocation differences among schools should emerge. This article examines school-level spending patterns in New York City public elementary schools. First, earlier research on resource allocation is reviewed. Then data and methods are explained, high- and low-performing schools' allocations are analyzed, and future research directions are suggested.

Earlier Research

Since schools produce educational outcomes and actually expend resources, basing accountability and policy in schools rather than districts is a logical progression, and school-level research seems most useful to inform future policy. However, data at the school level are often incomplete or inaccurate. Moreover, access to school data is difficult in states where information is aggregated at the district level. Further, states vary widely in collecting and reporting methods. Conceptual difficulties also arise through unclear staff-time accounting, varying concepts of school units, and inconsistent definitions of functions and objects such as teaching positions.

Despite such problems, some states and cities have made efforts to improve access to school-level financial data, though more state efforts are needed. Findings regarding school spending patterns have been surprisingly consistent. Most studies find that schools spend approximately 60% of their budgets on instruction with little variation in relation to levels of per-pupil expenditure or school size. Comparisons of instructional and administrative expenditures to investigate possible diversion of classroom resources have shown that high-performing urban schools often allocate less discretionary spending for administration than do weaker schools. However, combined administrative expenditures in a New York State study were low enough, about 11%, to conclude that such allocations have little effect on student outcomes.

Increasingly, investigations have examined how schools can reallocate existing revenues to support reforms. Additional resources have been largely dedicated to hiring additional staff, independent of the school's budgetary discretion; more fundamental reforms like class-size reductions are usually initiated with federal categorical funding. Another concern has been allocational inequities. These are less likely to appear in intradistrict comparisons, given district tax-base uniformity, but such comparisons have shown that teachers with less training and experience are more likely to be found in urban schools serving primarily students from low-income families. Districts often allocate positions rather than salaries to schools, which may exacerbate this problem.

Data and Methods

The New York City public school system is the largest in the country, with over one million children and over one thousand schools. With full budgeting and instructional authority, 32 subdistricts govern the system's presecondary schools. The Central Board of Education allocates resources to the subdistricts through formulae for teaching positions and other needs. However, the system is changing dramatically through its new Performance Driven Budgeting initiative, which links budgeting decisions at the school level to instructional decisions with the goal of improving performance. Begun in six strongly managed subdistricts, the initiative in its first two years has shown success, including earlier allocation decisions and computerized budgeting implementation.

The authors used the city's data on expenditure, teacher and student characteristics, and student reading and math achievement for public elementary schools. The rich expenditure data were classified by type of expenditure, educational setting, and funding source. City, state, and federal funding sources were specified. Data were collected on over 600 schools for 1997 and 1998. Students were typical of large urban districts. They scored around the national median on reading exams, were 75% poor (according to federal school-lunch eligibility), and 16% had limited English proficiency. Average per-pupil expenditures rose from 1997 to 1998.

These data were used to select subgroups of high- and low-performing elementary schools and to compare their allocations of resources. Schools were judged on the basis of increases in the proportion of their students scoring above the national median on the exams. The authors selected schools through a value-added model, using the change in the percentage of students who scored at or above the 50th percentile on the reading test from the previous year's third grade to the current year's fourth grade, and controlling for socioeconomic variables.

The difference between schools' expected performance (as predicted by socioeconomic characteristics and previous test scores) and their actual performance was used to rank them into quartiles. Those schools that appeared in the highest and lowest quartile for both 1997 and 1998 were then selected for the purposes of analysis as higher and lower performing schools, of which there were 34 and 37, respectively.

Results

The value-added regressions yielded significant findings. First, the model accounted for 75% of the variation in reading performance. Second, immigrant status was, surprisingly, positively associated with performance, while English proficiency had the expected negative association. Perhaps immigrant families cluster near better schools. Third, poverty was, also surprisingly, not significantly related to performance, possibly because of the close relationship between third-grade test scores and poverty.

Comparison of the two school groups showed them to be similar in socioeconomic characteristics, such as poverty and the percentage of students with limited English proficiency. However, analysis revealed large differences in student reading gains between third and fourth grades. In low-performing schools, the percentage of students scoring above the 50th percentile decreased between third grade and fourth grade in both years, while the high-performing schools showed large average gains between the two grades. And while in both years the weaker schools moved from slightly above the city reading average in third grade to just below the median in fourth grade, the stronger schools moved from well below to well above the median from third to fourth grade.

Differences also emerged in financing. While both groups spent more per pupil than the city average, lower performing schools controlled less of their spending, and they received less of their funding from city and state aid. Key differences appeared in teacher characteristics. While both groups spent similar proportions of their funding on teacher salaries, the stronger schools examined exceeded the city average in teacher salary, experience, education, stability, and qualifications, while the weaker schools examined proved below average in these characteristics. These results suggest that teacher distribution may be related to student performance.

The pattern does not indicate causality, however. Since city union rules favor senior teachers when positions open, senior teachers may go to schools with higher performing students. This explanation is unsatisfactory, though, because both school groups were similar in student socioeconomic characteristics, and higher performing schools showed lower third-grade performance. Still, exogenous characteristics of students and schools may run counter to practices of resource allocation in attracting teachers. Without further research, no rigorous conclusions can be drawn about the effects of teacher qualities on student performance, but these results suggest that better teachers, not just more funds for teachers, are important to student success.

Further significant patterns appeared in other spending functions. Most of the budget was spent on direct services in all schools. Over 80% of the resources spent on direct services was spent on classroom instruction. Because most of this funding was directed towards personnel, there was little room for flexible spending. Instructional support and leadership allocations, the next largest budget share, varied little from school to school. However, while both school groups dedicated less than 1% of school-level budgets to professional development, high-performing schools allocated twice as much per pupil. Stronger schools also dedicated more per pupil for paraprofessionals and for instructional support, while weaker schools spent more per pupil on teachers.

More differences in proportional spending appeared in the spending that was controlled at the subdistrict level. The subdistricts of weaker schools spent more for direct services and instructional support and less for professional development and leadership than did the subdistricts of stronger schools.

In a comparison of the two groups in base funding from the city and state operating aid, minimal differences emerged. But in other funding from federal programs like Title I and from other state and private sources, significant differences became evident. The lower performing schools allocated about $50,000 per school less of such funding to paraprofessionals, instructional support, and professional development, while allocating more for teachers. Half this difference stemmed from higher spending for instructional support in the higher performing schools.

Conclusions and Future Directions

School-level financial reporting in New York City provides rich detail on spending but cannot definitively relate financial information to educational outcomes. Moreover, the lack of variation in spending across schools makes it hard to identify expenditure patterns that definitively improve achievement. Further, the lack of expenditure differences between stronger and weaker schools is surprising. Another notable finding from this research, furthermore, is the greater variation in spending patterns found for resources that schools themselves control, such as those from Title I.

Future research could explore disparities between high- and low-achieving schools in different test subjects, grade levels, and years examined, ideally using student-level data for more precise analysis of achievement changes. More microanalysis of expenditure patterns is needed to detect variations in expenditure that school or district averages obscure.

⌘

The Relationship Between Student Performance and School Expenditures:

A Review of the Literature and New Evidence Using Better Data

Corrine Taylor, Wellesley College

The questions whether and how much additional school spending improves student outcomes remain essential to policymakers allocating limited resources to schools and other public programs. These questions have been investigated for over 30 years, and the results of econometric studies of "the educational production function"—of effects of school inputs on student outcomes—vary widely. Positive, inverse, and no effects have been found. Major syntheses of studies have also reached opposing conclusions.

This article reviews the educational production-function literature to explain the varying results. It then describes how new, combined data sources allow researchers to examine three overlooked empirical issues related to conflicting findings. Finally it reviews the author's analyses of those issues and relates new findings to earlier research.

Literature Review

DIFFERING FINDINGS

The many production-function studies have differed, often because of data variation, in the following five ways. First, studies varied in the *choice and measurement of outcomes and input variables*. Educational or labor-market outcomes were examined as outcomes, and school expenditures, teacher salaries, or class size were input variables of interest. While researchers preferred to examine as many family and peer control variables as possible, no consensus arose on the variables' importance or measurement. Second, the *unit of analysis* differed, despite consensus that analysis of student-level outcomes and spending would be ideal. In reality, school resources were usually reported at higher levels, from classroom to state, constraining studies to these variously compiled inputs.

Little consensus developed on the third difference, *geographic scope*. Nationwide studies offered superior input variation, but inability to control for different state policies resulted in omitted-variable bias. Favoring nationwide scope, some studies criticized statewide studies for endogenous biases. A fourth difference arose in studies' *functional form*. Earlier studies assessed achievement once without considering prior influences, but later studies controlled for earlier achievement, isolating the value added of the inputs. Finally, analyses employed various *estimation techniques*. Most used least squares regression, but recent studies incorporated advanced econometric techniques to address problems like selection bias. These differences have contributed to disparate results on the relationship between student outcomes and school inputs. Several syntheses combining results of primary studies have addressed whether any systematic relationship exists.

SYNTHESES

The earliest syntheses concluded that school resources and performance were not consistently linked. However, the synthesis method used—vote-counting—has been widely criticized. More sophisticated meta-analyses using the same pool of studies have recently shown positive and substantial links. Comparison of these methods can help evaluate their merits.

The vote-counting syntheses categorized the relationship between input of interest and outcome for each study as positive, negative, or unknown and categorized the relation as significant or not. These "votes" yielded a percentage distribution of estimated direction and significance for each input of interest. In one vote-counting synthesis, though most studies (61%) showed positive relations, only 27% were statistically significant, so it was concluded that there was no strong relation. Yet no rules determined what proportion of significant positives was necessary to support a systematic, positive relationship. Moreover, vote-counting overlooked sample and effect sizes, which affect statistical results. The method was not statistically sophisticated enough to support or reject hypotheses about associations between inputs and outcomes.

More recent meta-analyses have used two more sophisticated methods: combined significance testing and effect magnitude estimation. Combined significance testing calculated probability values from studies weighed by sample size to test significance for school inputs. All inputs tested showed positive coefficients, and the majority showed no negative coefficients, suggesting that the overall input–outcome relationship was positive.

Effect magnitude estimation measured effect size, indicating the strength of the relationship between a dependent variable—achievement test scores—and specific independent variables across studies after rescaling to align variables measured differently. Positive coefficients were found for each input in the full analyses and in study subsamples. The median effect size for per-pupil expenditure (PPE) showed a $500 increase in expenditure associating with a large but plausible achievement increase of .15 standard deviation. In sum, more sophisticated syntheses tend to support positive school effects, and better data becoming available facilitate better primary analyses.

New Data and Evidence for the Relationship Between Expenditure and Achievement

Though policymakers are concerned about the relationship between PPE and achievement, studies of PPE effects have been hindered by aggregated expenditure analysis without family background data and value-added factors. However, combinations of relatively new data sources allow researchers to analyze three crucial production-function issues not explored earlier: (a) interdistrict variations in education costs; (b) the endogeneity of students' decisions to stay in high school; and (c) production-function differences in varying school settings.

To analyze these issues, three national databases from the National Center for Education Statistics can be combined. First is the National Education Longitudinal Survey of 1988 (NELS), which is a nationally representative sample of eighth graders who were tested and surveyed in 1988, 1990, and 1992. A second data source can be added to NELS: the Common Core of Data (CCD), which includes 1990 to 1992 district financial data and 1990 census data, including special-needs and community information, tabulated for districts. A third source that can be combined with these is the Teacher-Cost Index (TCI), which measures variations across districts in nondiscretionary teacher resource costs, using teacher survey data from 1990 and 1991.

Merging these data creates a panel of 14,000 public-school pupils with detailed student, school, and expenditure information. The author has used this panel in regression analyses to examine the three overlooked issues described above. Student math test scores from the 1992 NELS were the outcome of interest and PPE the explanatory variable of interest. Control variables for eighth-grade achievement measured gains, and other variables measured the influence of student, peer, school, and community features.

ANALYSIS 1: RESOURCE COSTS AND STUDENT NEEDS

Since resource costs (notably teacher compensation) and the proportion of costly special-needs students can vary substantially, overlooking these factors can lead to underestimation of the link between expenditure and achievement. Thus controlling for such fiscal variables should increase the effect of PPE on achievement. The author tested this hypothesis, using cost-adjusted PPE and controlling for student proportions needing special education, English-proficiency support, and compensatory education. Positive relations between PPE and achievement were found. Coefficients were consistently small, and relational increases were too small for these fiscal factors to account for the weak expenditure–achievement relationship in the literature.

ANALYSIS 2: ENDOGENEITY OF EDUCATIONAL ATTAINMENT

Few input–outcome studies have measured the endogeneity of secondary students' educational attainment decisions. Dropouts are simply excluded from most studies. But when school-input effects on the decision to stay are overlooked, the research suffers from selection bias. If we assume that higher achieving students are more likely to stay in school and that PPE correlates with the proportion of students staying in school, then the effect of expenditures on achievement should be statistically stronger for all students than for those who stayed considered separately. To test this hypothesis, the author used the NELS test scores of dropouts in a two-stage selection–correction procedure to estimate direct and indirect (through attainment decisions) effects of PPE on achievement. Findings here showed that correcting for the endogeneity of attainment decisions only slightly increased the effects of PPE on achievement.

ANALYSIS 3: DIFFERENCES ACROSS SCHOOL SETTINGS

Researchers have documented striking differences across school settings in resources and student, teacher, and community characteristics. The panel data revealed that inner-city and poor rural students were educationally disadvantaged in family and community resources. Additionally, school spending for these students averaged about 5% less than spending for students from suburban, White, and advantaged (SWA) schools. Test and retention outcomes were also lower for disadvantaged students.

A deeper question is whether educational production functions themselves differ across inner-city, poor rural, and SWA schools. Separate production-function studies were conducted for the three distinct school settings, and the magnitudes of the coefficients on PPE were compared. Findings revealed that PPE effects on student achievement varied significantly across the settings. Inner-city effects were consistently small, while poor rural and SWA students enjoyed larger, positive, and significant effects close to the .15 standard-deviation level and much larger than the effects in the resource and attainment analyses.

Conclusion

This new contribution to the educational production-function literature indicates a positive but relatively small effect of school expenditures on student achievement. Improvements in addressing differences in resource costs, special-needs student populations, and student retention produce small changes in the measured effect of PPE on student achievement. The benefits of conducting separate analyses for different school settings appear to be greater. The main policy implication of this research is that simply equalizing PPE for similar student populations is insufficient to produce similar student outcomes. Further effort must determine which purchased resources are most effective for different students and settings.

⌘

Exploring the Nexus Between Educational Inputs, Distribution of Performance, and Incentives

Samid Hussain, Cornell University and Cornerstone Research

In response to the current movement to improve performance standards in public schools, policymakers have been examining more carefully the productivity of educational inputs, whether of funding, teacher quality, or incentives. Research on productivity (known as education production-function research in the literature), most of it identifying the effects of inputs on student achievement tests, has yielded mixed results, largely because of disagreements about the best ways to measure productivity.

Conflicting evidence on the degree to which inputs improve performance has fueled debate on allocation of resources to schools. Research has called for more rigorous examination of inputs like class size, teacher test scores, and teacher education. A key assumption of past research, that only average test scores of a school's students matter, has overlooked potential effects of various inputs on the distribution of test scores.

Examining these effects might help policymakers aim resources and incentives at benefiting those low- or high-achieving students whom inputs may influence more. Some evidence has shown that increased spending benefits low-performing students more than it benefits other student groups, so focusing attention only on average scores might be misguided.

Building on earlier research, this study advances past analyses of education production functions in three ways. First, the study explicitly links teacher incentives offered by schools to productivity of inputs, specifically by examining schools that do and do not recognize teachers' accomplishments. Second, it examines how resources and incentives impact the entire distribution of student performance in schools. Third, it investigates whether improvement in mean performance is associated with improvements in performance of low performers or whether improvement in mean performance takes place at their expense. Discussed are the economic optimization model underlying the study and the data, econometric method, results, and implications for policy reform.

Propositions from an Optimization Model

The study begins with a theoretical model linking educational inputs to the distribution of performance under alternative incentive types. The model focuses on the central administrative goal of learning by all students and on issues of motivation at the decentralized level. The theoretical model distinguishes between the impact of implicit salary incentives based on experience and education and that of explicit salary incentives based on student performance.

This theoretical model leads to three propositions. First, effort at decentralized levels is consistently high only where incentives are explicit. This result may reconcile mixed evidence in the existing literature regarding the relationship between performance and educational inputs when key student characteristics are controlled for. Second, an increase in dispersion in performance associated with an increase in the mean performance will be less dramatic in an explicit incentive regime than in a regime offering few or no incentives. Third, a salary-based incentive scheme may be a very costly approach to motivating teachers and school administrators to put forth high effort.

Data

The study uses the National Educational Longitudinal Survey of 1988 and its two-year follow-up study of a range of data from nationally representative samples of 8th and 10th graders. The sample analyzed here was limited to 10th-grade public-school students who took a mathematics achievement test (IRT) in the 8th and 10th grades. In order to analyze the effects of inputs on performance, 3,500 students were sampled, while for examining mean–variance trade-offs at the school level, 7,750 students in 811 schools were studied.

Also considered was information on whether or not schools offered recognition of teacher accomplishment like load relief. Such recognition was used as a proxy for teacher incentives.

Method

The econometric estimation of the relationship of inputs and performance proceeded in two steps. First, the standard value-added specification was adapted for school incentives in order to investigate the determinants of student performance together with school incentives. This step permitted testing whether the effects of selected variables differed between schools with or without incentives. Second, the question of how the benefits from higher average performance were distributed among students was investigated. Here, the dispersion in performance at the school level was operationalized by the standard-deviation measure, while the arithmetic mean of the student performance was used to describe the average performance. All relationships were analyzed by using both least squares and simultaneous quantile regressions. Detailed analysis and tabulation of these regressions appear in the book, *Improving Educational Productivity*, resulting from the conference summarized in this issue.

Results

The first major finding from this study was that educational inputs and incentives differentially impacted the student performance distribution.

More specifically, school inputs mattered more for the low performers and were frequently more productive in schools that offered some incentives. With regards to the teacher characteristics, the majority of teacher variables were not statistically significant in schools that did not recognize accomplished teachers. For example, the amount of teacher experience was relatively more productive in schools with incentives in terms of both the mean effect and the effect at the lower part of the performance distribution.

The second interesting finding pertained to contrasts between those teachers who had standard certification (relative to provisional or no certification) and teachers who had bachelor's majors in mathematics. Specifically, if a teacher had standard certification, then he or she was relatively more productive (in terms of the mean effects on student peformance and the effects at the 5th and 75th quantiles) in schools that offered no incentives. In contrast, if a teacher had a bachelor's major in mathematics, then he or she was relatively more productive (in terms of the mean effects and the effects at the 5th and 75th quantiles) in schools that did offer incentives.

The third important finding was that higher starting salaries, controlled for experience and education, were associated with higher student performance in the lower part of the performance distribution (i.e., 5th and 25th quantiles) only for schools that recognized accomplished teachers. This effect suggests that, to the extent that those with the lowest salary teach the lowest performers, increasing the salary floor increases performance at the bottom of the performance distribution. Hence, incentives work.

Another major finding was that not all of the educational inputs were consistently productive in schools recognizing accomplished teachers. This suggests that the existing incentives may not be sufficiently explicit to render all of the inputs productive. Such insights can allow policymakers to design interventions that target resources more efficiently and equitably towards low achievers and high achievers, while being attentive to the impact of incentives.

A further set of findings from this study pertained to the relationship between dispersion in performance and the average student performance. The key finding was that the relationship between dispersion in performance and the average performance was sensitive to the functional form estimated. This complication underscores the need for a more rigorous theory of potential trade-offs between mean and variance before a precise relationship can be ascertained. Also, an increase in mean student performance in schools that recognize accomplished teachers was typically associated with a less dramatic increase in variance.

Moreover, an increase in variance due to an increase in mean performance was less dramatic at the lower end of the standard-deviation distribution than at the upper end of the distribution in schools that recognized accomplished teachers. This suggests that such incentives are instrumental in restraining any increase in dispersion associated with the mean performance, especially at the lower end of the standard-deviation distribution. Other factors that differentially affected the dispersion in performance were school inputs such as school size, the lowest teacher salary in the school, the concentration of teachers with a master's degree, and the percentage of full-time faculty in math.

Conclusions

In the context of the public debate about standards and accountability as well as in the context of the research debate about the effects of education inputs on student performance, it has become increasingly crucial for policymakers to understand how policy-relevant, resource-related inputs are associated with productive student outcomes, so that they can allocate resources more effectively. This study's findings are relevant to that understanding.

The author's regressive analyses of national educational-survey data have shown that, at least in relation to mathematics performance outcomes, school inputs matter more for low performers and are frequently more productive in schools that offer teacher incentives. This suggests that policymakers should consider allocating more resources toward recognition of teacher achievement. Furthermore, incentives have been shown to be instrumental in restraining any increase in dispersion associated with an increase in mean performance, especially at the lower end of distribution. This finding also supports the use of resources for teacher incentives, since it suggests that recognizing teachers can have an equalizing effect, especially for weaker students.

⁂

In a future issue
of the CEIC *Review*,
find results from a
national invitational
conference on
class size reduction:
*Taking Small Classes
One Step Further*

Problems in the Estimation of School Effects:
Insight from Improved Models

Jens Ludwig, Georgetown University

Analysts agree that educational reform could be more effective if changes could be found that would generate better outcomes for a given level of school spending. However, determining the causal relationships between interventions and effects, which is needed for successful policy, is difficult. Differences among students can affect outcomes as much as inputs, and these differences are hard to isolate. This article examines these causal relationships, describing the evaluation problem in outcome analysis, explaining nonexperimental approaches to the problem, and assessing how well the approaches work and what we have learned from them. Standard approaches can yield misleading results and lead to ineffective policy.

The Evaluation Problem

Evaluating educational interventions is complicated, because we only observe outcomes that students experience for the interventions to which they were actually exposed, but not potential outcomes from alternative interventions. Therefore, identifying the differences that policies make is difficult. Program evaluation analysis thus uses statistical methods to estimate outcomes with and without exposure to interventions. Randomized experiments, by providing control groups equivalent to treatment groups, allow comparison between outcomes with and without interventions.

Unfortunately, since support for experiments is weak, analysts must rely mostly on nonexperimental comparisons of students who receive an intervention with those who do not, hoping that statistical methods can account for all the factors beyond the intervention responsible for different outcomes. The challenge for analysts is accounting for the many in- and out-of-school factors that may affect selection for intervention and achievement but which cannot be readily measured.

Researchers usually assume that educational inputs produce outcomes in linear-equation fashion: A set of measurable input factors amounts to the outcome without regard to differences between students, and a change in any factor will have the same effect on an outcome. However, students who receive inputs of interest may differ systematically from those who do not because of unobserved factors, causing analysts to confuse the input with the unobserved factor as the cause of the change in outcome. Self-selection and school targeting into programs are factors that are hard to observe in large-scale analyses. Many analytical approaches have tried to overcome this evaluation problem.

Nonexperimental Approaches

Most educational studies through the 1970s used a cross-sectional approach. Relying on data sets measuring students' background, school inputs, and test scores at one point in time, researchers hoped to gather enough data to account for all causes of student differences. However, unmeasured reasons for choosing or being assigned a given input have severely limited this standard approach.

The 1980s and 1990s saw an improved approach, represented by the U. S. Department of Education's High School and Beyond (HS&B) survey, which sampled high-school sophomores and seniors over more than 10 years. Multiple observations allowed researchers to study achievement after controlling statistically for students' previous test scores, under the assumption that previous test scores would serve as a proxy for unmeasured background characteristics affecting achievement. However, this value-added approach still left causal factors unaccounted for, such as test-score growth rate or factors intervening between test periods—a significant two years in the HS&B study.

Another approach to accounting for unobserved factors is using data from multiple children in the same family to control for unmeasured family variables, which are assumed to be constant and to affect all siblings equally. Therefore, differences between siblings receiving and not receiving an educational intervention are assumed to be due to the intervention and other measurable inputs. However, unmeasured differences between siblings may still bias estimates.

A further method for considering student differences that can bias simple statistical models is the propensity-score method. Here, student background data are used to estimate sample members' probability (the propensity score) of participating in the educational intervention of interest. Those receiving the intervention are matched only with those without it who match their propensity scores; unmatched data are discarded. If the background information is full enough, the treated and comparison groups will presumably be similar enough to factor out unobserved influences on outcomes.

A different approach is the instrumental variables (IV) method, which strives to identify a factor explaining why some students receive an intervention, such as school vouchers, and others do not. This factor is unrelated—exogenous—to student characteristics affecting outcomes. The exogenous factor can be related to the outcome of interest separately from background characteristics in a two-stage regression analysis. If the IVs are indeed exogenous to unmeasured characteristics and do explain reasons for intervention receipt, they can yield more accurate estimates of outcome. Like randomized experiments, the IV approach can identify and isolate factors affecting intervention so that choice for intervention is uncorrelated with specific aspects of the students examined. When the IVs identified are valid, this approach can be a powerful tool for overcoming self-selection bias. At the least, the method focuses analysis on reasons for student differences needing consideration.

A related approach, the two-stage selection–correction model, calculates distribution of estimated inputs to arrive at a nonlinear proxy for the unmeasured variables leading to selection bias. These calculations can be made even when valid instrumental variables are not available, but in that case the statistical validity of the proxy is affected.

Assessment of Approaches

How well have these approaches worked, and what has their application shown about educational policy effects? Value-added analyses, though highly regarded, have judged the effects of interventions poorly. Empirical testing of their application to the rich National Education Longitudinal Survey (NELS) of 1988 indicates considerable bias. Comparison with a randomized class-size experiment shows that the value-added model, based on incremental gains, cannot explain the large one-year gains appearing in the experiment.

Nonexperimental methods have generally been unable to reproduce experimental estimates, as comparison of experimental and nonexperimental data in adult job training has shown. More recently, systematic testing has permitted identification of nonexperimental models that match experimental estimation more closely. A recent comparison of a randomized housing-mobility experiment relating relocation to welfare benefits showed a good match between experimental and value-added results. However, nonexperimental approaches have estimated outcomes for young people less well, contradicting the experimental result that adolescent relocation to low-poverty neighborhoods reduces violent crime arrests.

Similarly, nonexperimental estimates of neighborhood and peer influence on academic outcomes have differed from experimental results. While cross-sectional regressions have found little effect, randomized experiments have shown significant test-score gains. Further research on such discrepancies is needed.

The more sophisticated nonexperimental approaches have yielded important new information about education policy. The controversial Head Start program, for instance, has shown no or negative effect on children when standard models were used, but sibling-difference models, applied to the Child–Mother File of the National Longitudinal Survey, have indicated that Head Start positively affects test scores for White and Black children, though gains for Blacks fade within a few years, suggesting that it is the environment of Black children, not Head Start, that accounts for the fading of effects.

Cross-sectional and value-added analyses of another controversial issue, school funding, have yielded mixed results, and bias seems significant even with rich data sets. With IV models, however, results have been less equivocal. Additional school spending showed decisive benefits to test scores in several studies; in one study the gains were five times as large as in simpler models. Spending on class-size reductions was also shown to improve elementary student achievement in IV estimates, though not in a study based in Connecticut, where class sizes are already small. Analysis of computer spending and use yielded less conclusive results, since cross-sectional analysis showed some associated test-score improvement, but more convincing IV analysis showed no significant improvement resulting from computer use.

Whether school vouchers for private-school choice improve outcomes has also been debated, and while local voucher experiments suggest that private schools may be more effective than public, national analysis requires nonexperimental approaches. Value-added studies of NELS data have found only small test-score advantages to private schools, but self-selection bias is hard to discount here. It has been challenging to find IVs to eliminate this bias. One IV study used exogenous variation in public-transportation availability to examine nonacademic outcomes; this analysis associated private religious schooling more strongly with lower adolescent conduct problems than in simpler estimates. In sum, more sophisticated analytical models tend to show more definite results for policy interventions.

Conclusions

Review of nonexperimental policy evaluation highlights the value of sophisticated methods while emphasizing the need to scrutinize the role of self-selection in both program choice and outcomes. Analytical methods controlling for self-selection and other unobserved factors have yielded *larger* effects than less controlled models. This suggests that negative selection needs attention. That is, compensatory targeting of many programs toward at-risk children leads to understatement of program productivity in standard models, since targeting leaves many student and family variables unmeasured.

Finally, since econometric advances have improved estimations of educational program effects, researchers should use cost-effectiveness analyses more vigorously to identify programs producing the greatest student gain for given expenditure. That would help policymakers compare the effectiveness of education programs to that of housing or health interventions to help children.

⌘

(**Making**, continued from p. 1)

offered in five general areas: accountability; markets; theory; research; and working relations among analysts, policymakers, and educators.

ACCOUNTABILITY

It was agreed that accountability should be improved through better informing taxpayers and other concerned community members about how funds are distributed for achieving the school's outcomes and about how and whether outcomes are being attained. New forms of accountability and estimation—including school-site budgeting and decision making as well as longer term, value-added outcome measures—should be introduced, if carefully planned and executed.

MARKETS

A greater market role in resource allocation was recommended to improve accountability and productivity. The introduction of market mechanisms through vouchers or privately governed charter schools can motivate schools to become more efficient. Moreover, introducing market forces into teacher hiring and compensation practices, for instance by flexibly matching teacher preferences with school needs, may lead to more effective teaching. The strength of traditional practices tying compensation strictly to education and experience argues for carefully planned introduction of such changes.

THEORY

Economic theory, conferees suggested, can play a large role in improving school productivity, both through assessing productivity and enhancing our understanding of complicated educational finance issues like adequacy and equity. However, economists must consider theory and findings from other social sciences to encompass the full range of causes, effects, costs, and benefits of education policies and practices. Especially important is recognizing conflicting interests among groups involved in education decisions (including economists). Such differences cannot be expressed in economic terms alone. It is also advisable that productivity researchers consider psychometric assessment of achievement and socioeconomic effects of student outcomes.

RESEARCH

It was also suggested that economists need better data than has been generally available. They should consider using the most detailed data, at the individual-student level, since it is likely to be most valuable in precisely estimating the influence of economic factors on student outcomes. Long-term data, especially on adult outcomes, should be compiled. Mixed and complementary research methods should be used. Typical statistical analyses with large, single-point data sets should be combined with such methods as randomized experiments and small-scale, closely monitored studies of program implementation. Such intensive research may allow better understanding of what works best for specific groups of students.

WORKING RELATIONS

Participants urged future work to address pressing questions regarding the improvement of relations between those working at various levels of education service. Which government organizational strategies will improve schools most? How should state certification and professional development practices be reformed to help teachers develop more effective classroom techniques? How can private and public schools be encouraged to compete productively? How should private and public funding be integrated for optimal outcomes? What large- and small-scale reforms will work best together to ensure student success?

Conclusion

In light of these difficult, open questions and the broad areas for future research, policy, and practice recommended, the conferees agreed that further conferences like this one and dissemination of productivity findings for a wider audience are much needed. The participants celebrated this collaborative effort to analyze and discuss solutions to problems related to continuing limitations in knowledge of what makes schools work. Through such exchange of viewpoints and finding of common ground, economists and educators can productively work together to improve students' futures.

In Memoriam: Margaret Wang

Margaret Wang provided the energy and vision that made this conference possible. The conference occurred just after her untimely and unexpected passing before Thanksgiving of 2000. Her spirit was clearly present throughout the conference and continues to guide this work. She was excited about the conference and the response it elicited. It is fitting that Margaret be connected to this theme. She understood and appreciated the importance of economics and was eager to bring this perspective more to the foreground of debate. Inspired by her memory, her colleagues welcome and encourage the further development of this work.

⌘

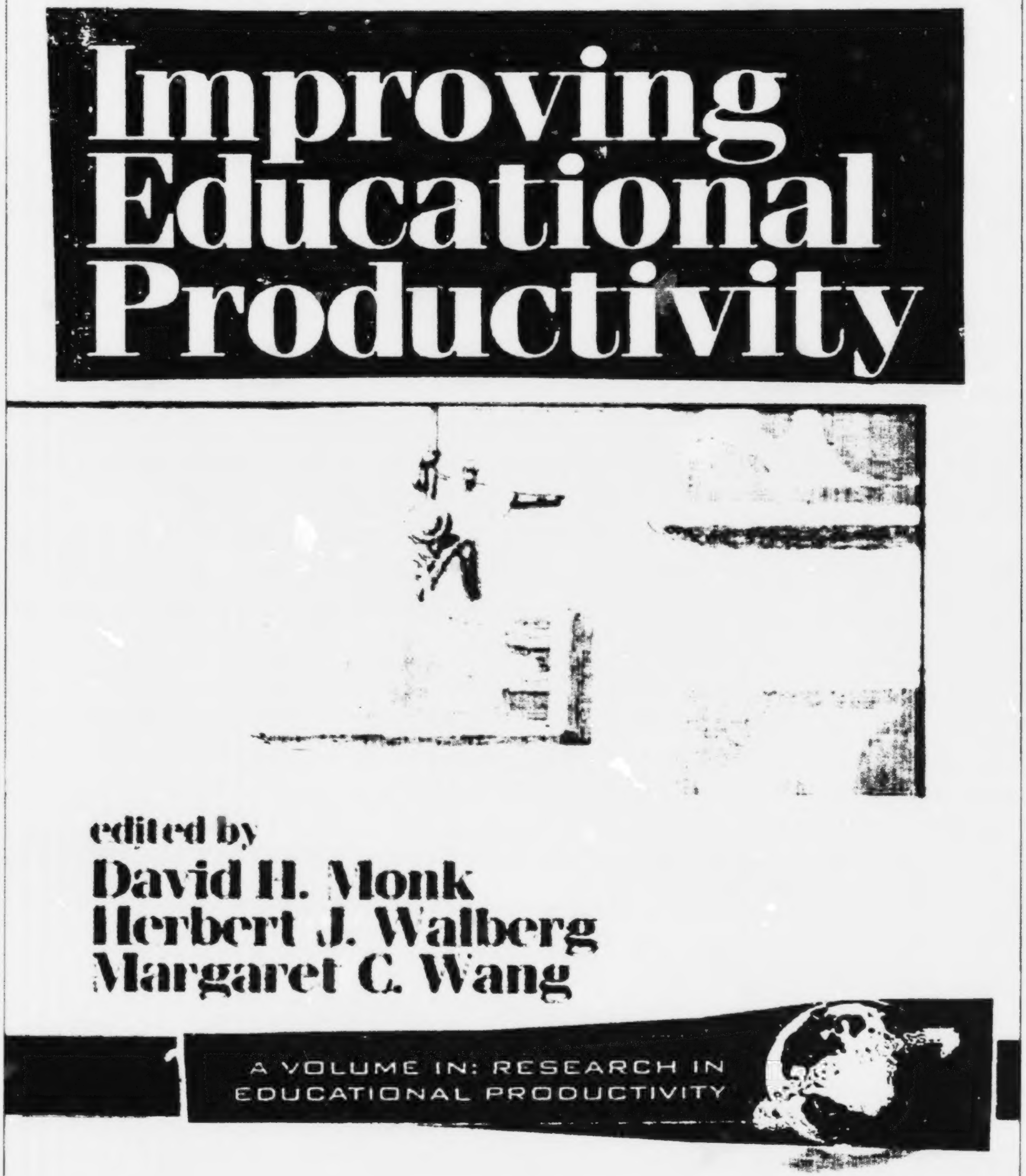
The CEIC
REVIEW

Mark Rohland
Editor

This publication is supported in part by the Laboratory for Student Success at the Temple University Center for Research in Human Development and Education (CRHDE). The opinions expressed do not necessarily reflect the position of the supporting agencies, and no official endorsement should be inferred.

For more information, write CEIC, Temple University Center for Research in Human Development and Education, 1301 Cecil B. Moore Avenue, Philadelphia, PA 19122-6091, or call (215) 204-3000. Selected CEIC publications and abstracts of articles, including back issues of the CEIC Review, are available at http://www.temple.edu/LSS/ceicrevlist.htm

Find the papers commissioned for this conference in a book now available from Information Age Publishing:



Improving Educational Productivity

edited by

David H. Monk
Herbert J. Walberg
Margaret C. Wang

A VOLUME IN: RESEARCH IN EDUCATIONAL PRODUCTIVITY

Temple University Center for Research
in Human Development and Education
1301 Cecil B. Moore Avenue
Philadelphia, PA 19122-6091

Non-Profit
U.S. Postage Paid
Philadelphia, PA
Permit No. 1044

The CEIC
REVIEW
A catalyst for merging research, policy, and practice.

The National Center on
Education in the Inner Cities

Volume 10 • Number 8 • September 2001

School-to-Work: Accomplishments, Problems, and Prospects

Reports and Recommendations from a National Invitational Conference

William J. Stull and Nicholas M. Sanders, Temple University

The school-to-work (STW) movement comprises individuals and organizations in both the public and private sectors who work together to bring about a fundamental change in the way the nation educates its young people and prepares them for the world of work. The goals of the movement are twofold: (a) to enhance the academic learning of all students by connecting subject matter to the world of work, and (b) to ease students' transitions from school to meaningful work. Over the past decade, a variety of reform efforts have been launched to achieve these goals.

A major defining event of the movement was passage of the School-to-Work Opportunities Act of 1994 (STWOA). The goal of this legislation was to create a national workforce development system by providing financial and other incentives for states and localities to develop STW programs that met their particular educational and economic needs but also satisfied a broad set of federal requirements. States received grants under this legislation after establishing statewide partnerships made up of STW stakeholders. The statewide partnerships distributed funds to local partnerships that then worked to establish STW systems in individual schools and districts. By 1999, all 50 states, Puerto Rico, and the District of Columbia had received STWOA development and implementation grants.

Funding from this legislation ceases this year, and it is unlikely that any new initiatives will emerge to continue federal support for the broad STW concept. However, although the U.S. economy has performed very well in recent years, the need to provide STW services for a broad range of students continues. This is particularly true for at-risk students in urban and rural areas.

In this setting, two broad, interrelated issues of educational policy were addressed at a national invitational conference sponsored by the Laboratory for Student Success at Temple University's Center for Research in Human Development and Education and held in Philadelphia on December 4 and 5, 2000. The first policy issue concerned the accomplishments of the movement in curriculum innovation, participant satisfaction, student learning, student labor-market success, and other outcomes. Are some STW interventions clearly successful, and should they be replicated elsewhere? Are there others that have proven to be unsuccessful and should be dropped or modified? Which interventions have been particularly successful (or unsuccessful) with adolescents at risk?

The second issue addressed by the conference was the future of the STW movement in a world in which federal support is greatly reduced. To what extent and in what ways will states and localities fill the funding gap created by the withdrawal of federal funds? Should state and local support be more targeted towards non-college-bound youth? Is the approach through state and local STW systems established by the STWOA the best way to channel resources to the grassroots level? Which STW activities are most likely to survive in the post-STWOA world?

To answer these questions, the conference brought together 70 economists, educational researchers, and STW program practitioners to share their research and experience with various programs. In this issue of the CEIC *Review*, we have summarized the 19 commissioned papers presented and discussed during the conference. The participants also joined in sessions to hammer out next-step recommendations for the STW movement. These recommendations, along with acknowledgments of Plenary Session Chairs and Discussants, follow the summaries of the papers.

The National Center on Education in the Inner Cities is a unit in the Temple University Center for Research in Human Development and Education, an interdisciplinary center devoted to fostering healthy developmental and educational success of children and families in this nation's urban communities. Inquiries about the work of the Center should be sent to Information Services, CRHDE, Temple University, 1301 Cecil B. Moore Avenue, Philadelphia, PA 19122-6091. Copyright © 2001

New Economy, Old Economy: The Educational Implications

William C. Dunkelberg, Temple University

Many economic analysts have observed that the combination of soaring stock market values and technological innovation since 1995 suggests that America has developed a "new economy." Despite much speculation about new products and services to be generated, the new economy has been poorly defined. This article investigates its nature, its added value for consumers, and its effects on the labor market and the educational system.

Clearly, the new economy is fundamentally a more efficient, computer-supported version of the old one. As it has in the past, American education can adjust to the demand for new skills, but not without overcoming difficulties posed by rapid change in educational needs, family structure, and rigidities in the educational system.

What Is the New Economy?

The American consumer's daily experience has not changed radically in the past five years. The chief differences can be attributed to the subtle effects of computer use, which have led to widespread increases in efficiency in the delivery of products and services and to lower costs for such items as home electronics. There is nothing entirely new, however, in increasing computerization, which has been a trend since long before 1995. Businesses have certainly benefited from the most recent changes—for example through business-to-business transactions over the Internet, which cut operating costs—but the changes just give businesses faster and more effective ways to implement existing practices and to identify, reach, and serve consumers.

Thus the new economy is clearly *better* but not necessarily *new*, since it changes how businesses and consumers do things more than what they produce and buy. A key factor in this improvement has been growth in high-tech production, which has accounted for about a third of GDP growth in recent years, including exports, which have doubled in this sector since 1990. Employment has also improved in high tech, increasing at twice the rate of job growth in the economy as a whole over the past 6 years. Overall, however, high tech is still a very small part of the entire economy.

Stock markets define the new economy less clearly, since the high-tech firms like Microsoft associated with the changes hit unbelievable new market highs but subsequently lost much of those gains, while traditional stocks have languished. Most of the gain in the Nasdaq market was due to about 20 new-economy stocks whose futures were unclear but clearly overrated. The new firms and their products do not seem to have modified the rhythms of the old market processes. Job growth indicates more plainly what is new, as the number of information-technology service jobs has increased to support successful software products, and high-tech manufacturing jobs have grown more rapidly than total manufacturing. But even here major effects can be indirect, as in the most rapid areas of job growth, amusement and motion pictures—both old-economy industries dramatically affected by the computer chip.

Perhaps the notion of the new economy might be applied as well to fundamental changes beyond the high-tech arena, such as immigration, which has reached new highs. As a result, large ethnic enclaves have developed with separate economies that have not been well integrated into the mainstream. Policies like bilingual education have reduced the incentives for integration, and it could be that further cultural and economic fractionalization will be a key challenge to national progress in the next decade, especially in ethnically diverse and economically important states like California.

What Value Does the New Economy Add?

To succeed, a business must provide something of value, and the success of the consumer-driven economy depends on firms offering "value-added" goods and services that seem more valuable than the price charged suggests. Any such value added to products in the new economy is hard for consumers to see, since it is hidden in the computers that improve them without making them seem entirely new. The major impact of the computer chip is virtually invisible to consumers, contained in business processes that lower costs, raise productivity, and provide more information for better-informed management decisions.

Moreover, there is nothing essentially new about such technologically added value, since for the past few centuries technological innovations have regularly led to similar improvements. All major innovations (electricity, the telephone, the automobile) have spurred investment booms after affecting the economy for a period of time. It took many years actually to convert manufacturing from steam to electricity. Perhaps what really differentiates this new economy from those of the past is the speed at which the new technology permeated the economy.

Although the Internet can produce only information, audio, and video products, its development will have very important implications for communication between consumers and businesses (e.g., the trouble afflicting the U.S. Post Office). Internet

(**New Economy**, continued on p. 33)

The Youth Labor Market in the 1990s: An Overview

Michael A. Leeds and Elizabeth Wheaton, Temple University

In the 1970s, economic inequalities between men and women, Whites and Blacks, and highly and less educated workers diminished but, in the 1980s, differences grew, particularly for the most educated workers, whose real wages grew dramatically while those of less educated workers fell. The convergence and divergence during these decades have led economists to offer various causal explanations, which can be classified under four types: (a) supply and demand, focusing on the effects of the supply and demand for skilled workers on wages and employment; (b) trade, emphasizing the effects of changing trade patterns, especially import growth, on worker well-being; (c) technology, stressing the impact of technological advances and access to technical training on economic opportunity; and (d) government policy, granting a crucial role to civil rights and economic policies like affirmative action and minimum wage laws.

This study examines unemployment and wage patterns in the most recent decade, 1990–1999, in order to determine whether the convergence–divergence patterns have continued. The youth labor market has been chosen for analysis, because it represents the entire labor market well and is more sensitive to economic change, younger workers typically being more vulnerable to job loss and wage decline and being more able to benefit from new opportunities. Youth labor trends can also predict later employment prospects of young workers.

The authors have focused on unemployment to measure the breadth of economic expansion and on wages to measure its depth. They have investigated the youth labor market with respect to the labor market as a whole, educational levels, race, and gender. Analysis of economic data from the Annual Demographic File of the Current Population Survey (CPS) has shown that except for gains for college-educated Black workers, the 1990s showed no significant convergence or divergence in the youth labor market. Yet since causal factors like the decline of trade unions remained influential, the existing explanations of the trends in earlier decades seem inadequate.

The Overall Economy and the Youth Labor Market

As for American workers as a whole, the 1990s were a good decade for young workers (defined by the authors as those aged 19 to 24 and out of school). U.S. and youth unemployment both declined, though the youth rate remained higher. Young workers' wages also tracked those of prime-age workers, dipping earlier in the decade and rebounding later. Contrary to the expectation that youths would be more affected by economic changes, wages for prime-age workers rose more sharply with the improved economy at the decade's end. The wage gaps at the beginning and end of the decade did not differ significantly.

Despite arguments that minimum-wage policies influence the youth labor market, minimum-wage trends did not correlate strongly with youth unemployment. Hikes in the wage eased joblessness for high-school dropouts, especially Blacks, but the hikes showed little relation to dropouts' real wages. A decline in the percentage of union workers did correlate negatively with youth employment. These findings give us reason to doubt both the policy and the trade explanations for employment patterns.

Education and the Youth Labor Market

According to some models, again, wage returns for education fluctuated in the 1970s and 1980s in response to variations in skilled-worker supply and demand. Despite technological advances and changes in the percentage of college graduates, neither unemployment nor wages of dropouts, high-school graduates, and college graduates converged or diverged during the 1990s, as supply and demand and technology theories might have predicted.

Unemployment differences between educational groups grew early in the decade and shrank later, remaining steady overall. Unemployment rates were inversely related to education level. Real wages showed similar consistency. Despite early declines and late boosts in wages, differentials remained steady between groups. College graduates earned the most and enjoyed the greatest difference from the other groups, while dropouts' and high-school graduates' pay rates remained close.

Race and the Youth Labor Market

The 1980s saw significant losses for Black youth in the labor market, erasing their virtual wage equality in the late 1970s with White youth at the same schooling level. The weekly wage gap between races rose from 13.6 to 17.9% between 1980 and 1989. The losses were particularly great for Black college graduates, whose pay fell from near equality to 17% below that of White college graduates. The causes of this drop are unclear, since urban job loss, exported labor, union decline, and low minimum wages should have had little impact on Black college graduates.

In the 1990s, modest economic divergences between Blacks and Whites emerged. Unemployment followed the decade's rise and fall, though the rise for Blacks lasted a year longer. The unemployment differential was greater at the end of the decade as the Black–White differential

(**Youth Labor**, continued on p. 33)

Education and Training in an Era of Creative Destruction

Leonard I. Nakamura, Federal Reserve Bank of Philadelphia[1]

The American economy is in a period of rapid, accelerating change. The kinds of work done and the corporations employing workers are changing more rapidly than ever before. Because of recent technological advances, both occupations and corporate practices are evolving so quickly that even advanced educational institutions, such as medical schools, struggle to train workers for the future. This rapid change is best described in terms of Joseph Schumpeter's theory of creative destruction, in which the economy is increasingly devoted to continuously creating new products and services, which entails the continuous destruction of old ones. Jobs too are constantly being created and destroyed, and workers must prepare for lifelong job change and its concomitant, recurrent job and career education.

It is unclear how well our educational system, created to serve a more stable, hierarchical economy and thus under increasing stress, will manage this transformation. This study examines economic change over the past 25 years, placing it in historical context, and offers suggestions for coping with the resulting educational problems.

Work in an Era of Creative Destruction

The economy of creative destruction divides workers into creators who innovate and producers who are subjected to constant change as they carry out the creators' plans. Creators imagine new products and then must work to mass-produce them while communicating their value. Although such creations may be accepted on their merits, conflicts often arise as the inventions challenge the economic status quo. By giving profits of innovation to creators and affording them a wide market, capitalism motivates and enables them to overcome resistance.

Producers, typically still using old mass-production techniques, must learn new skills and increase job-related formal training as the economy becomes more creative. Educators must help them learn quickly and confidently from failures, adapting actively to workplace change. College education is intended to provide intellectual foundations for lifelong learning, but secondary education typically is not. Technology may foster improved education for both creators and producers.

Economic Change in the 20th Century

From 1900 to 1980, large managerial, sales, and clerical staffs, composed largely of high-school graduates, supported the nation's mass-market economy. This carefully managed organization allowed coordinated production and sales within corporations, enabling lasting profitability. Consequently, large firms could control research and development of products, the pace of production, and marketing strategies.

In the past 20 years, however, these conditions have changed drastically. Technical progress in electronics has rapidly automated information processing and communication, accelerating product development and marketing. Rewards for innovative production have risen quickly, as global and niche markets made possible by electronic technology proliferate. In particular, electronics-based changes in retailing—such as product scanning, e-commerce, and superstores—have reduced the cost of selling new products and increased the profitability of innovation. This technology allows start-ups to compete in product development and sales where they could not have in the past, so creativity now yields more success than stable corporate structures, which may indeed prove to be liabilities. This leveling of the playing field has fostered creative destruction throughout the economy.

As the profitability of creative assets has risen, the stock market value of successful creative corporations has risen, driving up the overall value of the U.S. stock market. But the resulting intense competition has made individual stocks riskier.

Further, consumer spending patterns have changed dramatically over the past decades. The proportion of our budgets spent on necessities—food and clothing—has dropped from 33 to 24%, and recreation expense has become greater among those with lower incomes. New products, many designed to be purchased for style rather than function, are driving the economy as never before.

Occupational Change in the 20th Century

Early in the century, workers who produced goods and services dominated the workforce. At the century's end, less than half of workers are producers. Most employees are now white-collar sales and clerical support personnel or decision-making professionals like executives, service professionals like doctors, and technical or creative professionals like engineers and designers. These levels correspond to educational levels: Statistics show that producers generally do not need a high-school diploma, sales and clerical workers do, and professionals require a college degree.

In the 1990s, two thirds of new jobs went to professionals. Throughout the century, their numbers have grown steadily to about 33% of the workforce, while the number of direct producers has fallen steadily. The percentage of agricultural workers has fallen from 38 to 3% since 1900.

---

[1] The views expressed here are those of the author and do not necessarily reflect those of the Federal Reserve Bank of Philadelphia or of the Federal Reserve System.

That of industrial workers has fallen from 36 to 25%. The percentage of sales and clerical employees grew from 7.5% in 1900 to 28% in 1980, but it has stagnated since then, because advances in electronics have reduced the need for these workers.

Creative positions, one sixth of the professional sector, have grown fastest. These workers, including both science-based workers like programmers and culture-based ones like artists, average, as do other professionals, twice the pay of production workers, but the pay range is widely dispersed. For continuing profitability in this creative economy, new products must constantly be generated, which means that the workforce must constantly change as technologies develop and companies restructure. Technological innovations in the past quarter century have sharply increased the number of science- and art-based creators.

Economic Change and Education

Before 1900, few students attended high school, and those few were primarily on their way to college and professional careers. But the growing mass-production economy required educational change. Companies demanded large clerical and sales forces to administer increasing transaction volume. Since these workers needed high-school-level science, math, and reading skills to perform effectively, a public secondary education movement evolved, improving the U.S. workforce as the number of high-school graduates grew rapidly. As these graduates diminished a high-school diploma's value, the wage gap between graduates and the less educated tended to close, particularly in the first half of the century.

The GI Bill and Vietnam-era student draft deferment fostered rapid growth in the population attending college between 1939 and 1969. As with the secondary education movement, equality increased and the wage differential decreased between college graduates and those less educated. Since the Vietnam-era bulge in college-educated students was absorbed in the 1970s, the onset of the new era of creative destruction has raised demand for graduates in many fields faster than supply, and the wage premium for higher education has advanced rapidly. As this wage premium has risen, the rate of higher education enrollment has accelerated, but so has the pace of change. Consequently, inequality has risen in the past 20 years.

Crises in Professional Services

The nation's 13 million professional-service workers, including 4 million in medical fields and 7 million educators, possess advanced training, yet rapid innovations have left them struggling to stay current with new developments. The pace of product and knowledge growth is outrunning that of professional education. For instance, rapid progress in medicine, now America's largest industry, challenges doctors with the overwhelming task of assimilating new knowledge. Randomized, controlled trials that provide important results about pharmaceuticals and procedures have multiplied so fast that no busy professional could study all relevant work.

Therefore, many doctors are unfamiliar with the best treatments, and as a result, they may overmedicate needlessly. One hospital has handled this information crisis by having doctors draw treatment recommendations from an updated database. Yet most doctors have resisted using such tools, fearing limits to their freedom and value in an era when profit considerations tempt administrators to cut medical staff.

Teachers experience similar pressures, since they must teach more information more rapidly to help students integrate new knowledge. Though teachers are less well trained and paid than doctors, they face corresponding demands to learn while working, and busy schedules often leave them inadequately informed. For instance, math and science teachers may lack training in computer programs for teaching geometry and dissection. Increased computer testing and teaching could free teachers to engage in more analysis of students' abilities, provide more individual rates of learning, and prepare pupils for lifelong computerized learning.

However, few schools have wanted to invest in intensive computerization, and teachers have balked, fearing the daunting amount of learning involved, the emphasis computerization may place on short-term goals, and the radical changes or even job loss that computers may bring. Moreover, educators often lack the interdisciplinary skills needed to teach innovatively according to students' existing talents, perhaps using computers to teach math to artistic students through the geometry of perspective.

Ultimately, however, as computers assume more teaching functions and our economy continues to demand a creative workforce, teachers may cope with crisis by assimilating technological innovations and fostering soft skills like creativity, communication, and cooperation instead of merely disseminating knowledge. Some high schools are already preparing for the future by offering courses in conflict resolution, since such techniques are increasingly useful in a workplace characterized by creative destruction.

Conclusion

The economic changes resulting from electronic advances have led to dissatisfaction with current educational practices. Since the economy will increasingly demand creative and technologically skilled workers, the crisis in education must be addressed, perhaps through using new electronic techniques for enhancing skills. These might help today's students become the lifelong learners who will succeed in the creatively destructive future.

⌘

Has School-to-Work Worked?

Alan M. Hershey, Senior Fellow, Mathematica Policy Research, Inc.

The School-to-Work Opportunities Act of 1994 (STWOA) set an ambitious education-reform agenda. It responded to criticism of how American schools were preparing youth for productive careers and of schools' part in maintaining a leading role for American industry in an increasingly competitive global economy. STWOA aimed to improve the way schools prepare students for the future, drawing on theories of how students learn best, models of technical education practiced in Europe, and elements of American vocational education. It envisioned four changes:

- *Local partnerships* among schools, postsecondary education and training institutions, employers, labor, and others would produce graduates with the skills needed in the emerging new economy.
- Students' experiences would increasingly involve learning about careers, formulating goals, and engaging in *career major programs* that would integrate academic and vocational instruction and work-based learning.
- An increased focus on career goals and learning skills in real-world context would *improve outcomes* for students at all ability levels.
- Federal STW funds would be seed money for development of a *durable* system of policies, programs, curriculum, and opportunities for students, lasting beyond the limited period of federal funding.

Evidence of progress in these four dimensions comes in large part from the National Evaluation of STW Implementation, conducted by Mathematica Policy Research, Inc. This study has charted the progress of local STW partnerships nationwide through annual surveys from 1996 through 1999, and it has examined the experiences of high-school seniors in the classes of 1996 and 1998 in eight states.[1] Studies by researchers at Teachers College, Columbia University, have contributed to our understanding of employer roles, curriculum change, and uses of work-based learning. Rigorous measures of the impact of STW programs on student outcomes are rare, but preliminary results are available from a nine-site evaluation, using random assignment, being carried out by Manpower Demonstration Research Corporation.

The Role of Local STW Partnerships

The availability of federal STW funding triggered the creation of local partnerships throughout most of the nation. Federal implementation grants were made in stages from 1994 through 1998, and states have distributed substate grants to a total of 1,894 local partnerships that include over 48% of all public school districts. In most cases, educators lead in establishing the partnership agenda and carrying it out. However, employers are participating in partnership activities in increasing numbers; by 1997, nearly 178,000 employers in 34 reporting states had participated in some aspect of STW programs.

STW partnerships have contributed most of all to the expansion of low-intensity career development activities. The number of employers providing brief job-shadowing experiences for students, for example, has steadily climbed from an average of 15 per school in the school year 1995–1996 to over 20 three years later. From 1996 through 1999, increasing percentages of partnership high schools offered career resource centers, job-shadowing, career-awareness classes, and career planning as part of individual guidance.

Changes in academic curriculum have been more limited, and the use of career majors is most prevalent in the most modest interpretation of the concept. Most often, schools create written course sequences suitable as preparation for various career pathways and use these as guides to help students choose their classes. By 1999, 48% of partnership high schools had adopted this practice, up from 41% in 1996. Less often, schools define programs of study combining academic and vocational classes, cluster together students with similar career interests in these classes, and in some cases require a workplace component. By 1999, about 40% of high schools offered such programs, but most often only for a small segment of the student body.

Workplace learning opportunities such as worksite visits, internships, and community service are being offered to students in more high schools, but usually without the strong connections to the school curriculum that STWOA envisioned. Furthermore, there have been only marginal signs in national surveys of high schools paying increasing attention to integrating academic and vocational instruction or to forging stronger links with postsecondary institutions.

Changes in Student Experiences

Student surveys in the National STW Evaluation reinforce the conclusion that the STWOA has contributed most to increasing participation in low-intensity activities aimed at promoting career awareness. From 1996 to 1998, there was a slight upward shift in the percentage of students who recalled engaging in job-shadowing or a worksite visit. Students in 1998 were more likely to recall school staff asking them to choose and focus on a career goal and more likely to have taken an academic class related to their career interests. This trend is probably a reflection more of increased guidance efforts than of changes in curriculum content.

---

[1] A third survey, of the class of 2000, will add to later evaluation results. In-depth study states were Florida, Kentucky, Maryland, Massachusetts, Michigan, Ohio, Oregon, and Wisconsin. Random samples of students representing the eight states overall were selected each year.

Student participation is increasing in the low-intensity work-based activities that schools are offering more commonly, but not in more intensive internships or apprenticeships. In both 1996 and 1998, about 28% of seniors said they had ever obtained a paid or unpaid position through their school. However, there is evidence that internships that students get through school are of higher quality than positions they find on their own in offering opportunities in more diverse industries, more training and evaluation, and better links between workplace and classroom activities.

Expanding student participation in programs that link school-based and work-based learning has been difficult. After several years of implementation efforts, fewer than 3% of students appear involved in a comprehensive program combining career development activities, academic and technical instruction, and related workplace activity. Such programs can be costly for employers and labor-intensive for schools, which must provide staff to develop curriculum, orient and place students, and monitor worksite activity. Moreover, to some teachers and parents, workplace activities constitute a distraction from the core academic objectives and test preparation that must be emphasized in response to increased state efforts to hold schools accountable.

Although exciting examples of STW activities in innovative schools exist, it has generally been difficult to integrate vocational and academic instruction on a large scale. This has been largely because of academic teachers' uncertainty about whether adding more applied learning in their classrooms will jeopardize students' academic performance and chances for college admission.

Student Outcomes

Proponents have argued that STW activities would increase engagement of low-performing students, improve motivation, and enhance success in school and in the transition to work. Research to determine whether such effects are being achieved has proved difficult. The breadth of STW activities makes it hard to define who is an STW student and harder still to define suitable comparison groups, and self-selection into STW programs has been difficult to control for.

Efforts to measure impacts have focused on career academies, a well-defined type of STW program. Some studies of career academies relying on comparison groups have found that participants outperform nonparticipant students on measures such as GPA, attendance, time to graduation, and skill development, but in general the difficulty of controlling for unobservable differences between the two groups has made it impossible to determine whether participation in career academies was the major cause of the difference in outcomes.

However; a more rigorous random-assignment study of career academies is showing that academy students achieve modest academic gains over control-group students, particularly where the academy's structure is personal and nurturing. Gains over controls occur in retention, attendance, academic course taking, and rate of on-time graduation from high school. It is not yet clear whether essential to such impacts is the career focus or simply the kind of smaller learning environment that the academies create.

Conclusion: Sustainability

STWOA has helped foster collaboration between schools and employers and helped change schools, and in some states and localities these efforts are likely to continue beyond the end of federal STW funding. More than half of the states appear likely to continue operating a state-level STW office. Almost half of the states have passed some kind of legislation to support STW reforms; in a few cases states have created comprehensive reforms to promote STW-type activities, such as Michigan's Career Preparation System. In other cases, however, state laws focus on narrow elements such as employer tax credits for student apprentices, and such steps have not proven to be very important in promoting the growth of STW programs.

Collaborative habits are likely to persist in many areas. The end of federal STW funding, however, may make it more difficult in many locations to dedicate the staff and other resources needed to convene partners for professional development, agenda-setting, and sharing of problems, progress, and useful products. Of the partnerships whose federal funding has already ended, about half appear to have stopped functioning one year later. In some cases, partnerships will continue to function without federal funding, but with perhaps only the most interested schools participating. Many individual schools are likely to find ways to sustain STW activities. The open question is whether local, and in some cases state, funding will be adequate to sustain and cultivate school–employer collaboration, continue the development of workplace activities for students, and expand the use of intensive integrated programs focused on careers.

⌘

Look for the next issue of the CEIC *Review*:

Taking Small Classes One Step Further

School-to-Work Governance

Bari Anhalt Erlichson, Rutgers, The State University of New Jersey

The 1994 School-to-Work Opportunities Act (STWOA) provided seed money to states for three types of endeavors: work-based learning, school-based learning, and activities linking the two. The act allowed states to decide autonomously how to structure STW governance and implementation systems. States set goals for their STW systems through governor-appointed committees, which typically included state-agency and private-sector representatives.

Some chose comprehensive goals such as systemic school reform; others focused on intermediate goals like improving vocational educational programs; still others chose programmatic goals like instituting skills assessment or business relationships. These objectives were planned within unique state and local policy contexts that shaped each state's STW initiatives.

Since the STWOA funding was designed to "sunset" after five years, sustainability has been an urgent issue. Some states embedded STW programs within existing agencies, while others linked them to larger initiatives, such as the 1998 Workforce Investment Act (WIA).

Over 10 months in 1997 and 1998, researchers of the School-to-Work Governance Project at Rutgers University, sponsored by the U.S. Department of Education, conducted a 37-state STW study. To assess the impact of governance on implementation, researchers interviewed involved respondents by telephone and on-site visits. This article provides an overview of governance and sample analyses of states categorized by goal focus: comprehensive, intermediate, or programmatic.

Governance Decisions

Decisions about objectives led to different governance structures and outcomes. States faced important structural choices: the STW office's placement within the executive branch, the interaction among stakeholders, and substate governance and implementation. The office's location was most commonly the department of education, while other sites included workforce development boards. Interagency coordination was typically managed through a team whose chief role was to foster communication.

All states also formed governor-appointed stakeholder advisory councils of business-industry leaders and agency members to advise STW policy. Usually this council was already in place as a workforce development council of which STW became a youth component. The councils were limited to a symbolic role with little oversight.

At substate levels, governance varied greatly. In 18 states, one level of local partnership, either regional boards or many local partnerships, was formed, while in 11 states, two levels—regional boards and local partnerships—were created. Local boundaries varied as well, depending on preexisting boundaries like economic development zones, community-college draw areas, and school districts. In state-to-substate articulation, substate partnerships were most commonly left independent within state funding guidelines. Some states targeted substate funding to specific STW activities.

Comprehensive-Goal States

These states linked the STW initiative to educational reform under strong state leadership. STW participation was widespread in these states down to the classroom level, and policy environments were often hospitable, as other initiatives reinforced STW. Researchers closely examined state contexts to understand how goals and governance interrelated.

In *Oregon*, legislation established career-learning standards. Students were to achieve two certificates of mastery, the more advanced requiring both academic and career-related learning. STW programs were implemented locally to improve advanced mastery. Both teachers and students benefited from extended learning experiences like internships, and progress has continued since STWOA funding ended. However, the Office of Professional Technical Education interfered with STW goals insofar as certificate guidelines were unclear and college-bound students were often overlooked. Oregon illustrates the risks of binding STW programs to school reform when leadership does not implement optimally.

Iowa used its local control tradition to pursue comprehensive reform at the level of school districts and curriculum coordinators, linking STW goals to school improvement. Consequently, STW was not seen as a separate educational program but as a realignment of existing ones. An interagency team combining educational and workforce administrators funded local initiatives directly, granting autonomy. Localities have made broad and sustainable curricular STW reforms without duplication or conflict.

Maryland, building on earlier career- and standards-based programs, integrated academic and vocational education through applied learning and career clusters. STW was linked to the state's new High School Assessment (HSA), which includes STW-related skills and community-service components. The Governor's Workforce Investment Board, combining private-sector and state-agency representation, oversaw substate governance built on local labor market teams. STW initiatives were considered less important than academic

HSA goals. Those goals may interfere with career-cluster construction, and the long-term progress of STW initiatives is in doubt.

Intermediate-Goal States

Here, STW activity has been less closely connected to educational reform than in comprehensive-goal states, despite broad purposes like raising students' skill levels or strengthening vocational education statewide. Stakeholder activity has been less coordinated, and the private sector has provided more leadership than the educational system.

In *Ohio*, the lieutenant governor oversaw an independent STW office and interagency implementation, coordination of which was imperfect, while the degree of STW involvement was uneven. Ohio focused on skill development for the emerging workforce, a goal that was supported enthusiastically by both business and labor. Funds were distributed to 12 economic-development regions and to teacher-education programs. Interested parties from many fields planned strategies for STW connections, and local program control was excellent.

However, the lack of accountability to the department of education hindered incentives for district and teacher participation in Ohio, though the state felt this lack eliminated bureaucratic problems and backlash against excessive oversight. Further, the lack of comprehensive goals limited initiatives to local projects. Where localities have built on existing in-school programs, propects for sustainability seems greatest. Further professional development may address teacher motivation.

North Carolina created career pathways for developing work skills and knowledge in both K–12 and postsecondary institutions. Its program, JobReady, was integrated with the state's broader Workforce Preparedness Commission. Leadership functioned through the state JobReady Partnership Council, which coordinated and monitored statewide and local progress. In local partnerships were representatives from businesses, vocational schools, and community colleges. Governance transcending agency boundaries helped JobReady function systemically, but the lack of educational-system siting limited school participation. Integration with existing efforts like the state's strong tech-prep structure helped local institutionalization but restricted STW efforts. Where business support is strong, programs may outlast STWOA sunset, though JobReady governance may not. Strong secondary–postsecondary tech-prep articulation requiring computer training and high academic standards may also further JobReady goals.

Colorado focused on integrating workplace competencies with state curricular content standards, but not as a formal educational requirement. Locally, some partnerships succeeded in meshing workplace competencies with district curricula, but the perception of STW as vocational education hindered efforts. Colorado also tried to link STW with workforce development at one-stop career centers. Leadership consisted of an interagency management team overseen by the Workforce Coordinating Council. Local partnerships, many sited at community colleges, were given broad discretion for designing initiatives. As STWOA funding ends, partnerships are reassessing goals and sustainability, since continued state support is uncertain.

Oklahoma, which located its STW office in the Department of Vocational and Technical Education, saw STW primarily as an effort to provide students with exposure to a range of postsecondary options and to equip them with the necessary skills and knowledge to succeed in the workplace and thus to meet local and state needs for a more skilled workforce. Most saw the location of the STW office as a strength, since the department has the staff and commitment for statewide implementation. However, collaboration between the STW effort and traditional education is occurring at the local and not the state level, because of the longstanding separation of vocational and traditional education.

Programmatic-Goal States

These differ from other states in that STW activity is even less collaborative and less integrated with existing agencies or policies. Often this has resulted not from intent but from unavoidable forces like opposition and fiscal difficulties.

The STW initiative in *Nebraska* attempted to improve emerging workforce quality with goals varying with the local economy. Where rural environments prevented much job-shadowing or apprenticeship, goals were limited to relating curricula to the working world. Although inadequate state education funding hampered all efforts, statewide implementation of the WorkKeys student-assessment tools saw modest success, as 80% of substate partnerships were involved. STW accomplishments were limited to successful events like career fairs or one-day job-shadowing. Leadership rested in an economic advisory board subcommittee. Substate partnerships varied with the state's urban–rural contrasts. Local control was both a strength and a weakness, since localities had great freedom but effectiveness was hard to assess. Chances for sustainability seem high in urban areas if WIA funds can be leveraged to successful programs, but low involvement and low educational funding in rural areas renders continuance doubtful there.

Conclusion

As indicated, states with comprehensive goals have often integrated STW principles and practices with academic standards. States with intermediate goals have seen less integration with education governance. States with programmatic goals have had to implement STW using less coordination with state agencies.

⌘

School-to-Work: The Wisconsin Experience

Mark C. Schug and Richard D. Western, University of Wisconsin, Milwaukee[1]

School-to-work (STW) initiatives are not new in Wisconsin. Its school districts generally featured vocational–educational programs throughout the industrial era. But by the late 1980s, these programs and the tracking system associated with them needed reform, given the state's unsatisfactory record in workforce development and K–12 achievement. A large-scale policy initiative followed to produce STW reform. This report reviews the background, evolution, and impact of the STW initiative.

Background

Twenty years ago, as certain industries declined in Wisconsin, the economy looked bleak. And the state's vocational programs looked outmoded. In response, a 1987 Education for Employment Act required career-related activities for all K–12 students. In 1990, the state's Commission on Schools for the 21st Century recommended broader initiatives, including business–school partnerships, apprenticeships, and a tech-prep program. These developments paralleled certain national efforts, including President Clinton's youth apprenticeship initiative.

At the same time, Wisconsin also sought to address problems related to low levels of effort and achievement in the schools. Studies throughout the 1980s showed patterns of low expectations and achievement, particularly in high schools, along with inadequate opportunities for students to learn about technology, work, and citizenship. These problems seemed especially acute in Milwaukee.

A common explanation of these issues has held that traditional pedagogy is merely custodial and irrelevant to students' needs. Meanwhile, situated-learning research has suggested that scholastic learning bears little relation to workplace learning, since the former stresses abstraction and individual thinking while the latter stresses shared cognition and learning linked to action. Theorists have contended that situated learning could provide more usable classroom experiences than traditional methods. Academic subjects could be enriched if teachers engaged students with apprenticeship experience. In recent years, this theory has attracted reformers as an alternative to discredited systems of vocational tracking. The theory has found substantiation in the German apprenticeship system, which has been said to motivate students, facilitate the transition to work, and bind students strongly to the reciprocal responsibilities of the working world. In Wisconsin, the German model impressed the governor and the superintendent of public instruction, who proposed a strong role for apprenticeships in Wisconsin's reforms.

Evolution

Wisconsin embraced the comprehensive vision of the 1994 federal School-to-Work Opportunities Act, which encompassed both school- and work-based programs for career training and job readiness. Milwaukee led with extensive plans for STW reforms. To govern the state's STW programs, a manifold infrastructure was created, including the Governor's Office, Department of Workforce Development, Department of Public Instruction, Wisconsin's Technical College System, and regional STW consortia. This complex administrative scheme made authority and accountability unclear. Acknowledging these administrative problems, the state consolidated STW authority in one Work-Based Learning Board in 1999.

Schools in Wisconsin have implemented STW practices variously, and district programs are in flux. The analysis that follows is based on summary data from state implementation reports, follow-up surveys, and interviews conducted with curriculum directors (CDs) from 45 Wisconsin school districts chosen at random.

State reports from 1995 to 1999 show steady growth in STW participation, preponderantly in school-based activities like career planning. However, few students have participated in workplace activities. While state projections had called for a 20% apprenticeship participation rate by 2000, the 1999 rate was only 1%. The disparity reflects the ease with which teachers can integrate school-based STW activity with regular classroom routines, while work-based learning requires restructuring and new resources. A rise in rates of school-supervised work experience during this time probably reflects Wisconsin's tight labor market.

Most CDs reported STW implementation activity in their districts, usually identifying it with work-based learning. School-based activities mentioned most frequently were career awareness and applied coursework. Connecting activities included business and technical-college articulations. Directors reported that STW had affected many teachers in a general, attitudinal sense, but they saw curricular effects mainly in career-preparatory fields like business and technology. Little STW impact on the required academic curriculum was perceived, and STW activities reported in program audits often involved renaming of field trips and other familiar school practices. Some CDs said that the state's emphasis on academic standards undermined STW implementation.

Reports on student participation and outcomes were mixed. While STW access was open to all and career-awareness activities seemed pervasive, in high schools, where STW activity was identified as primarily work-based, participation was low and concentrated largely among students not bound for college, although some college-bound students showed enthusiasm for technology-based courses and business apprenticeships. Low apprenticeship participation reflected scheduling demands some students saw as onerous, the limited capacity for work-based placements in many districts, and expense. No CDs could report reliable information on academic effects of STW like improved GPAs or graduation rates. Improvement in students' planning was anecdotally observed, but the impact of STW was not isolable from that of other programs.

---

[1] This synopsis is based on a paper revised and adapted from Schug, M. C., & Western, R. D. (1999), *School to Work in Wisconsin: Inflated Claims, Meager Results*, Thiensville, WI: Wisconsin Policy Research Institute.

Faculty STW involvement was low, concentrated among business, technology, and vocational teachers. In high schools, teachers committed to content often resisted integrated, thematic teaching; some teachers found concepts like "applied academics" unclear. Elementary teachers, though less content-committed, were no more STW-committed. Milwaukee's ambitious goals included STW integration with existing curricular requirements, business and postsecondary partnerships, and staff development. After a phase of intensive staff development, STW progressed in school-based but not work-based components. Despite a subsequent phase focusing on increasing knowledge and engagement, including job-shadowing for teachers, STW in the city's schools showed no significant success as measured by academic achievement, apprenticeship participation, or job placement rates.

Later analysis revealed problems, including unclear STW definitions and goals, uninvolved high-school teachers, and resource-management difficulties. Moreover, the district lacked established measures of STW-influenced improvement, so evidence of it could not be examined. Because of these difficulties, city leaders decided to revitalize vocational education instead of the more comprehensive STW initiative.

Impact

Wisconsin's STW efforts have benefited individual participants, who generally report high satisfaction, and employers, who have employed many of their apprentices. However, statewide impact has been minimal. Workforce conditions that motivated the policy have changed. Wisconsin's economy has rebounded, so it has been hard for schools to commit to STW as a policy predicated on economic decline. Workforce policy must now cope with a severe labor shortage, on which apprenticeships, the most successful component of STW, can have had little effect, given their low participation rate. Thus STW seems unrelated to the economic recovery it hoped to stimulate, and unless apprenticeship participation dramatically grows, it cannot have much future impact.

As an academic reform program, STW now looks marginal, since in the last half decade Wisconsin has stressed statewide reform in curricular standards and examinations. Thus STW programs, not aligned with the new standards and tests, cannot hope to gain administrators' attention. It is likely that the state's commitment to STW as an academic reform will fade, even if vocational schools and apprenticeships expand in some districts.

Conclusions

To suggest what might be learned from Wisconsin's flawed STW initiative, we offer the following critique.

First, the state's experience shows it mistaken to imagine that academic reform can be attained without an academic program. Wisconsin supposed naïvely that teachers would independently create new situated-learning programs for all curricular areas. Instead, teachers decided that STW advocacy for integrated, activity-oriented learning coincided with existing practices, and they innovated little. Recasting curricular goals by recommending more sophisticated conceptions of academic apprenticeship might seem to hold promise, but that has been tried before, unsuccessfully. Absent new knowledge about better ways of putting the idea to use, it is not likely to work now either.

Second, it is a mistake to try to impose a reform agenda through exhortation instead of demonstrated results. The academic reform envisioned by STW proponents could not have been achieved in the absence of a detailed, systematic, and pilot-tested curriculum to provide teachers with a firm basis for approaching their work in a new way. Even then, teachers might not have found an integrated, activity-oriented approach superior to disciplinary teaching. That question was not squarely presented, however, since the STW alternative was presented only as an idea, without evidence about its effects. The exhortative approach used instead of research, development, and systematic implementation antagonized educators and illustrated politicians' misunderstanding of education as an arena in which program adoption is a goal in itself, regardless of substance and results.

Finally, it is a mistake to conceive of K–12 education initiatives as vast, totalizing projects. Utopian pretension surrounding Wisconsin STW caused antagonism; it also blurred the potential for improvements that might have been gained via focused, work-related innovations. Further, since sweeping vocational-educational policies akin to STW have previously fostered the weak academic curricula that standards-based reform is now trying to correct, it made little sense to expect educators to embrace further threats to standards. STW money could have been used to better effect on a focused initiative offering strengthened work-related programs for those who wanted them. This more measured emphasis would have looked unsatisfactory only to educators who dislike choice and suppose that what is good in education must be good for everybody.

⌘

STW in the 1990s:

School–Employer Partnerships and Student Outcomes

John H. Bishop, Cornell University; Ferran Mañe, Universitat Rovira i Virgili; and Antonio Ruiz, Cornell University

Before the school-to-work (STW) movement began improving communication between schools and employers in the past decade, high-school achievement counted little in hiring decisions, because recent graduates could not signal skills and discipline to employers. Most requests for high school transcripts went unanswered, and employers hired workers with demonstrated job skills, freezing most graduates out of the primary labor market. Relegated to the secondary, unskilled market, graduates with strong basic skills saw a long delay before good job performance improved their income. Consequently, high-school students saw little relation between studying and labor-market rewards. Since they observed recent graduates with good grades holding jobs similar to those held by weak scholars, students not bound for college had little motivation to excel. Responding to this problem, the STW movement recommended that businesses reward high-school achievement in hiring and promotion practices and encouraged school–employer connections, including sponsorship of many STW activities.

This article investigates efforts to communicate student achievement to employers and discusses the effects of school–employer connections on the labor-market success of recent high-school graduates. Participation in collaborative STW activities from 1995 to 1997 is examined. It is proposed that better signaling of student achievement improves job quality for high-school graduates and strengthens learning incentives. Analysis of longitudinal data on the labor-market success of secondary students supports that proposal.

STW Participation

Data from the 1997 National Longitudinal Survey of Youth (NLSY) suggest that STW participation is higher than expected. Among 9th and 10th graders, 43% reported participation, commonly in career majors (19%) and worksite visits or school-hour work (12%), but more rarely in internships or apprenticeships (5%).

Demographically, participants did not differ substantially from nonparticipants. More differences appeared for specific programs and student attributes. For instance, students in school-based enterprises showed above-average family incomes, while those in career majors, cooperative education, and tech-prep showed below-average incomes. African Americans were more likely than others to be involved in internships and apprenticeships but not in school-based enterprises. Handicapped 9th and 10th graders were more likely to be involved in STW, especially in worksite visits. STW participants were more likely to live in unsafe, nonsuburban neighborhoods and to attend vocational and magnet high schools. They were less likely to attend private schools. School size related to participation in specific programs but not to overall involvement.

Policymakers feared that STW participation would reduce academic rigor, so programs were designed to support academic achievement, with apparent success, since participants surveyed took more honors math and science courses as well as more advanced computer courses. Some also feared that STW would become a dumping ground for weaker, non-college-bound students with poor scholastic attitudes. However, participants indicated good attitudes, and their grades, attendance, and likelihood of taking college-entrance exams resembled nonparticipants'. However, they disproportionately reported negative peer influences, with a minority confessing to negative out-of-school behavior evidently unmotivated by social environment.

Participants were also more likely to have worked for pay for longer periods—45% longer hours—and at a greater number of jobs. Hours were particularly high for students involved in intensive programs like apprenticeships. It seems likely that students who want paid work while in school seek STW involvement. Participants showed higher job satisfaction, but wages for jobs held since age 14 were similar for all but those in internships or apprenticeships, who averaged 20% higher wages. Most students held sales or service jobs obtained through social contacts; no occupational differences appeared between participants and others, except that worksite-visit participation correlated with more employment in skilled, white-collar occupations.

Improving Labor-Market Success for Graduates

In 1988, Bishop proposed that reliable information might encourage employers to reward high secondary-school achievers. Some consequences of increasing employment-related information to employers were predicted: (a) more employment after graduation, with better pay, training, and job security; (b) better jobs distributed more fairly by merit; and (c) greater student effort resulting from perceived rewards. Bishop also advocated policies for improving graduates' credentials, including vocational training, competency certifications, statewide examinations, increased awards for school accomplishments, grading systems accounting for effort and improvement, job-search courses, and employer mentors. Policies for improving school–employer connections were also recommended, including rewarding teachers for placing students; developing long-term teacher–employer relationships; formulating effective, equitable information-release policies; and developing standardized job-search portfolios for students.

Bishop stressed that schools providing job referral services could help students establish contacts and match student and employer needs. Disadvantaged students, often lacking middle-class families' work contacts, would particularly benefit. The best results would come from informal contacts between employers and vocational teachers, not from official, placement-office contacts. High schools developing and vouching for students' skills would combat the employers' stereotype of the unskilled, undisciplined graduate. In particular, higher standards, measured by minimum competency exams (MCEs) and school–business collaborations (SBCs), could provide assurances to employers.

These two mechanisms could improve job opportunities of recent graduates. Improving students' achievement through MCEs could raise work productivity, which could lead to wage gains. The exams could also increase employer confidence by signaling that all graduates meet hiring standards. SBCs could reinforce MCEs by convincing businesses that schools prepare graduates for work. Moreover, both mechanisms could provide employers with more information for assessing applicants. Academic achievement, which implies effort and reliability, could signal relative character strength among students, as could teacher referrals.

Such opportunities for students at schools requiring MCEs for graduation suggest the three following hypotheses, which were tested while controlling for family background and college attendance:

- Average GPA students will perform better in the labor market when they attend high schools engaged in SBCs.
- Rewards for academic achievement will be greater at schools with SBCs, so that high-GPA graduates will benefit more in the labor market.
- Students at high schools requiring MCEs will obtain higher wages and earnings after graduation than other schools' students.

Some previous research has supported these hypotheses. Obtaining jobs through high-school contacts correlated with higher test scores and with greater earnings nine years after graduation. MCE requirements were associated with higher wages and earnings five years after graduation, especially for the students in the lowest three quarters of academic performance.

Effects of MCEs and SBCs on Labor-Market Success

In this study, the hypotheses were tested, using data on public-school students from the National Education Longitudinal Study (NELS) of 1988, which followed a national sample of eighth graders from 1988 to 1994. Information on local MCEs and SBCs came from 1990 and 1992 surveys of high-school principals. A school-collaboration index was constructed from questions about school job postings, employer requests for student recommendations, employer partnerships, and business incentives (such as business-sponsored college scholarships) for high-achieving students. School-quality indicators were derived from the principals' questionnaires and NELS data. Early labor-market student outcomes included 1993 and 1994 earnings, wages, unemployment, and occupational level (service, retail, or labor). Analyses were well controlled for a range of academic and demographic variables, including state unemployment figures, although omitted-variable bias remained. Such analyses are susceptible to control-group contamination when STW participants and nonparticipants in the same school are compared, so comparing schools with and without STW programs seemed a better approach, though neither approach eliminates STW-selection bias.

Multiple-regression analyses showed significant correlations supporting the three hypotheses. SBCs significantly reduced unemployment and increased employment, wages, and annual earnings in the first two years after high school, substantiating the first hypothesis. Mixed support exists for the second prediction. SBCs improved unemployment, wages, and job quality for high-GPA students, but they increased months employed and annual earnings more for low-GPA students than for high. It seems that for low-GPA students, the effect of SBCs on annual earnings resulted from increased labor-force participation. Analysis also supports the third hypothesis: State MCEs raised annual earnings of average and A students by 9% and 14% respectively. MCEs significantly increased employment (but not earnings) of students with C - grades. The impact of local (scored) MCEs differed, positively increasing employment, wages, and earnings of A students, decreasing them for C - students, and having no effect on average students.

School-to-Work Policy Implications

The 1994 School-to-Work Opportunities Act stimulated STW activities, but most students are not attending high schools involved in act programs. Thus much STW activity reported in the 1997 NLSY was not act-funded, suggesting that the imminent end of Act funding may not decrease STW activity significantly. However funded, employer collaborations have tended to improve perceptions of schools' graduates and lead to improved labor-market outcomes.

Further, STW programs harm no students, benefiting all in some way. SBCs—unlike MCEs, which may hurt weaker students academically—give labor-market benefits without harm. Like earlier research, this study shows that SBCs, lacking negative impact on test scores, dropout rates, or college attendance rates, may be the most helpful aspect of the STW movement. Building such connections takes time and commitment, but five years of earnings benefits for a student cohort far surpass the likely annual costs of building a collaborative network for those students.

⌘

Developing Work-Based Learning Pedagogies

David Thornton Moore, New York University; and Katherine L. Hughes, Columbia University

Nationwide participation in work-based learning (WBL) is significant, involving over 25% of high-school seniors and large numbers of businesses in school-sponsored work. Researchers have attempted to measure the benefits of WBL, but they have paid less attention to the processes of teaching and learning—the pedagogy—of WBL. This article explains WBL pedagogy and its purposes, then asserts principles underlying WBL teaching and learning, including the need for professional development. The authors favor a critical, reflective pedagogy.

Defining Pedagogy in a WBL Context

Standard definitions of pedagogy are school-based, referring to strategies and tactics used to produce learning in classrooms and based on assumptions about how people learn and what they should be taught. However, since WBL students learn in the workplace, a broader definition is needed. Pedagogy encompasses features of a learner's social experience that shape the learner's engagement in creating or using new kinds of knowledge. Pedagogy is not merely teaching techniques and plans; rather, several factors intersect in it: the activities the learner participates in, the shared body of knowledge that members of the activities use, the social relations among members through which they organize their activities, and the resources they draw on to accomplish their purposes.

Pedagogy may be incidental, as in most WBL, a natural byproduct of the ongoing practices of a work group focused on producing something other than knowledge. Or pedagogy may be intentional, as in schools, focused on knowledge as the product. Understanding this distinction can help teachers, coordinators, and others involved in WBL envision pedagogy as more than teacher-driven, intentional classroom learning. Pedagogy also encompasses the incidental workplace learning that can shape the knowledge of the student worker as strongly as teachers' strategies can. The student worker's pedagogical context encompasses work and school, and educators must be aware of what is learned, and how, in both situations.

Pedagogical Models

WBL instructors and program designers have a fundamental choice to make about the political implications of their pedagogical approaches, which affect not only what students learn but also the way they relate to people and institutions and the sense of agency they develop.

Although oversimplified for the purposes of analysis and not mutually exclusive, two alternative pedagogical models for WBL can be contrasted to illustrate elements of teachers' choices. The first model can be called *functionalist* pedagogy, which assumes that the aim of WBL is to prepare students to perform functions in a workplace and economy in which required knowledge, skills, and social relations are understood as stable. The functionalist teacher assumes that we can identify workplace needs and teach them straightforwardly, focusing on core functional skills and traditional work habits. The functionalist model is an old one informing much current discourse on WBL.

The second model can be called *critical* pedagogy, which assumes that the aim of WBL is not just to train new workers but to create conditions for understanding and critiquing the existing work system, seen as socially constructed, possibly flawed, and subject to students' questioning and change. The critical approach endeavors to help youth change distributions of power and knowledge in work cultures as active learners, even as they develop functional skills. The critical model also has many precedents.

In practice, these models differ in various ways. First, preparation varies, as the functionalist approach tells students what they need to know to succeed at work, while the critical approach encourages them to question and make sense of experience. Second, instruction in processing experience varies, as the functionalist teacher encourages students to conform to supervisors' expectations, while the critical teacher helps them construct understandings of their roles as learner and worker. Finally, forms of evaluation vary, as from the functionalist perspective, success equals demonstration of job readiness, while from the critical perspective, success equals understanding work systems and developing students' identities within the work community. Though the models overlap, educators should be more aware of both. Observations of WBL programs indicate that the dominant approach is functionalist, suggesting lack of understanding of critical pedagogy.

Principles Underlying Critical Pedagogy

Several strategic principles underlie critical pedagogy for WBL. First, program coordinators need to conduct a *learning opportunities analysis* of potential placement sites on the basis of the broadened conception of pedagogy. In numerous programs, placement practice seems to assume that knowledge-rich organizations will inevitably make rich learning environments. But learning theory suggests another premise: that the amount of knowledge-use the intern can participate in is more important than the knowledge existing in the organization. A placement may involve many highly skilled people performing highly complex tasks in which a student cannot engage meaningfully, so educational potential may be lost. Therefore, before designing classroom strategies, program coordinators must think about how students' experiences in proposed sites will unfold. An intern serving as a file clerk in a large law firm, for example, is likely to be exposed to less complex knowledge than an intern serving as an animal clinic who sees operations and assists veterinarians. Coordinators would need to plan supplementary pedagogy differently for these two interns.

Second, *reflection* is indispensable to the WBL process. Without efforts to question work organization, students will slip into unexamined attitudes towards work implicitly taught on the job, some of which, like acceptance of authoritarian supervision and unjust hierarchies, need to be reflected on so that students can develop individual attitudes about work. Much thought within the pragmatist and constructivist philosophical traditions supports reflective participation of learners in constructing knowledge. Empirically, it has been shown for college-level service learning that specific, extended reflection fosters academic and personal growth.

The peculiar position of the intern creates a superb opportunity for such reflection, because she simultaneously occupies two different roles: worker and student. As worker, she is supposed to be competent at performing functional tasks; as student, she is assumed to need to learn. The dialectical tension between these roles generates a powerful dynamic toward trying to make sense of the work. A school-based WBL program that provides dialogue and adult guidance for resolving workplace issues can help participants develop a transformative, reflective experience transcending the on-the-job training every worker receives. Examples are given to show that awareness of critical pedagogy can help interns avoid such limitations of the functionalist approach as unreflective acceptance of counterproductive managerial practices.

A third principle for critical WBL pedagogy is that *connections to academic knowledge are extremely important*, going beyond applying concepts to work experience, since applied knowledge learned in school is not necessarily transferable to the workplace. Thus students should be encouraged not only to relate academic knowledge to work applications but to examine the relations critically, looking for differences, contradictions, and problems. Academic knowledge must supplement work knowledge, and both must be subjected to reflection. An intern in a physical-therapy clinic, for instance, should be exposed not only to medical but also to psychosocial factors affecting the patients she serves.

Fourth, teachers must not just disseminate information but *help students construct knowledge themselves*, encouraging a practical learning community that fosters critical discourse about WBL among students. Moving beyond traditional didacticism, teachers can learn to introduce critical concepts and ask probing questions to help students interpret their experiences and learn from each other.

Finally, critical pedagogy is *the responsibility of the school-based instructor*, not the work-based supervisor. The critical perspective is usually not appropriate at work, and school instructors are best situated to help students understand why that is so. Long-term changes in WBL may result in workplaces more congenial to critical inquiry but, until then, such reflection is best practiced in school. The authors have elsewhere identified specific pedagogical tactics schools use in good WBL programs, such as learning plans, journals, and seminars. These tactics support the broader strategies of critical pedagogy, especially examining relationships and activities to understand their underlying assumptions and values by means of a group process of collaborative inquiry about work and ideas.

Professional Development for WBL Educators

Whether educators choose functionalist or critical pedagogy for WBL programs, they will need professional development, since traditional forms of teacher education do not prepare them for this kind of work. The active and contextual nature of WBL means that instruction must be different from customary academic subject instruction in the classroom. Yet the increased emphasis nationally on WBL has not had a discernible impact on teacher training and certification.

What educators wish to foster in the students—the ability to think critically about work and worker issues and to participate in a community of practice facilitating such reflection and discussion—should first be fostered in the WBL instructors. Hence teachers and other school staff need experiential education. Guidelines for and examples of teacher internships are given in the article. Worksite visits can have a significant impact on teachers. As for students, it is important for teacher interns to reflect on their experiences.

Conclusion

The critical approach has been criticized as an elitist practice available primarily to the privileged. The idea that WBL chiefly functions to make students better learners and not to prepare them for jobs can be condemned on the grounds that getting jobs is most important for working-class and poor students who have limited links to the culture of learning. Reflection on work, society, and life is indeed a privilege in our society, but it should not be. Critical pedagogy gives all students, not just the privileged, the opportunity and the ability to understand their worlds more fully and to take charge of their lives. Teaching can have no higher purpose.

⌘

The Impact of School-to-Work on Minority Youth

Francisco L. Rivera-Batiz, Columbia University

The difficulties of the school-to-work transition have concerned policymakers for many years. Unemployment rates for youth leaving school continue to grow, with teenage unemployment at 14.4% in August 2000 (27.8% for Black youth), much higher than the national average. Youth earning power has also declined, with weekly earnings of workers aged 16 to 24 dropping significantly in the past 15 years, especially for those lacking high-school diplomas. The frequent job-hopping of young workers also reflects the difficult transition, as many young workers find themselves without stable careers.

In the past decade, school-to-work (STW) programs have attempted to resolve such problems. By minority students, however, these programs are often viewed with skepticism. The perception is that the tracking of minority youth into traditional vocational education programs in the past has had negative effects. Lack of school–employer collaboration, the replacement of academic courses by job training, and tracking into low-skill jobs have been associated with such negative impacts. Attempting to correct these deficiencies, the STW movement has offered innovations to strengthen school–employer bonds, integrate academics with work content, and provide opportunities at all skill levels. All states have received federal STW funding, many instituting their own STW initiatives.

This study examines differences in STW participation of racial and ethnic minorities and analyzes the positive impact of participation on academic and work outcomes for minorities. The study analyzes interview data collected in the National Longitudinal Survey of Youth for 1997 (NLSY97) and a 1998 follow-up survey, which followed the school-to-work transition of 8,984 students aged 12 to 16 in 1996. Included here are 2,204 Black (non-Hispanic), 1,771 Hispanic, and a majority of White (non-Hispanic) adolescents.

STW Involvement of Minorities

School and employer participation in STW programs has expanded in the 1990s. Has minority involvement also increased? Minority participation in traditional vocational programs exceeds the national rate, and according to NLSY97, Black youth also participate more in the new STW programs, but Hispanics participate less. Follow-up data corroborate this finding.

In two STW program categories, career majors (a course sequence based on an occupational goal) and STW preparatory programs (from employee job-shadowing to intensive apprenticeships to comprehensive tech-prep programs including work and postsecondary preparation), STW involvement increased from 1997 to 1998, growing from about a third to about half of NLSY97 students. As in 1997, Black youth's overall participation rate was highest in 1998—51.2%—and Hispanic youth's lowest—41%—with similar differentials for the two categories. Whatever the category, STW participation increased with grade level, rising from 37.8 to 66.7% of Blacks from 10th to 12th grade, with an even sharper rise for Hispanics. The survey also showed that minority youth participate in the more intensive tech-prep and apprenticeship programs more than Whites, indicating that they are not being channeled into less intensive programs.

The results indicate cause for concern in the lower STW participation of Hispanic youth. Reasons for lower Hispanic involvement were examined through probit analysis of the variables affecting STW involvement. The results suggest that immigrant status is critical in lower Hispanic involvement. About 43.2% of Hispanic youth in NLSY97 were born outside the U.S., a much greater percentage than for Whites and Blacks. Of Hispanic immigrants, 36.1% showed STW involvement, while 47.2% of Hispanic nonimmigrants took part, about the same as did Whites.

A possible cause of lower immigrant involvement in STW programs is limited English proficiency, which may force Hispanic and other immigrants into special school language programs that are not integrated with STW activities. In the NLSY97 sample, 65% of Hispanic youth lived in households not using English as the language of communication.

Consequences of STW Programs for Minority Youth

Existing evidence on the outcomes of STW programs has been mixed. Improved job skills and expectations have been found, but studies of effects on academic achievement have yielded conflicting results. Moreover, research showing positive correlations has not often established causal relations because of the absence of controls from before STW participation. The study examines causal relationships between participation in STW programs and various student outcomes by using 1997 data from initial NLSY97 interviews as well as the recently released 1998 follow-up interviews. This data set allows controls for background variables and can determine before-and-after effects.

IMPACT ON MATH AND SCIENCE COURSES

The impact of STW participation on the number of math and science courses taken by high-school minority students was found to be highly significant. Although a multivariate analysis of the determinants of math and science course taking using the NLSY97 showed no significant effect of STW participation on the math and science courses taken by White youth, it found a significant impact for minorities, both Black and Hispanic. On average, minority students participating in STW programs took one more math and science course in the year following their STW participation than other students, holding other factors constant. Participation in STW programs also increased the number of math and science courses taken by minority students during the same year the STW was occurring, but this effect was not as significant. This suggests that STW participation enhances the math and science curriculum for minority youth not so much by requiring that students take such courses as part of the STW program as by motivating students to take them in the future.

IMPACT ON HOURS WORKED

Understandably, STW involvement motivates students to work. However, work may also spur students to enroll in STW programs. To analyze this complex causal interconnection, the author investigated the effects of STW participation until 1997 on hours worked the following year, controlling for demographic and school variables. The analysis indicated that STW involvement in 1997 correlated positively with 1998 hours worked, holding other things constant. This suggests that there is a causal relationship inducing STW participants at any given time to increase their hours worked at a later time. Indeed, participation in STW programs in any particular year is associated with 45 extra hours of work in the following year for Blacks, 43 hours for Hispanics, and 36 for Whites. These results indicate a clear link between STW participation and subsequent labor-market participation.

IMPACT ON SCHOOL RETENTION

Some existing studies have shown that STW involvement increases high-school graduation rates, while others have indicated that the increased incentives for labor-market participation linked to STW reduce retention. A probit analysis of the factors determining dropout rates in the NLSY97 demonstrates that, controlling for demographic and school-related background variables, STW participation is negatively associated with the likelihood of dropping out of school, though it does increase student work hours. By stimulating students to take career-oriented academics more seriously, STW programs motivate students to stay in school while at the same time increasing their work hours, particularly among minorities. No conflict was found between school retention and increased labor-market participation among STW participants in the NLSY97.

Conclusions

The study provides evidence of the positive effects of STW programs on minority youth. In general, the STW

(**Minority Youth**, continued on p. 35)

Forthcoming from Praeger in 2002:

The School-to-Work Movement

Edited by William J. Stull and Nicholas M. Sanders

Career Academies and High-School Reform Before, During, and After the School-to-Work Movement

David Stern, University of California, Berkeley

Educational reformers interested in improving the transition from school to work have been keenly interested in reconfiguring high schools to promote the combination of vocational and academic educational paths. Combining these two traditional paths can improve students' chances of college and career success. Reasons for integrating the paths include supporting the strong economic motives for continuing to postsecondary education and mitigating the effects of increasing after-school work hours.

After decades of development and evaluation, career academies based on integrated paths have been found effective in improving high-school students' performance and postgraduation options. Though not the only form of vocational–academic integration, career academies are distinguished by their durability, definability, and dependability in producing student success. This paper describes the academies' evolution, reviews their assessment, and explains their role in reconstructing high schools.

Evolution

After their 1969 inception as an electrical academy in a Philadelphia high school, the number of career academies grew steadily for two decades; since 1990, their growth has accelerated, particularly in California. Until the mid-1990s, career academies existed only as smaller units within high schools, but since then, numerous high schools have converted themselves entirely into career academies or into other small learning communities. Career academies can be defined by three basic features:

- First, they are small learning communities comprised of a cluster of students sharing some teachers and classes. Both academic and technical teachers are dedicated to the academy's instructional and administrative concerns.
- Second, they combine college-preparatory curriculum with a career theme, such as health care or business. Academic courses meeting graduation and college entrance requirements are linked with career-focused courses. Teachers may coordinate both course types and teach work skills in both. Work-based learning opportunities link curriculum to career-related work.
- Third, career academies form employer partnerships. Community business representatives may advise academies, speak to classes, mentor students, supervise internships, and provide financial support.

The first career academies in Philadelphia focused on retention and vocational preparation, but soon they evolved to include college preparation. In 1981, California established computer and electronics academies, and the success of these and similar academies led to strong legislative support. California academies, now ranging over 25 career fields, advanced the notion of simultaneous college and career preparation.

Other regions, especially cities, have established career academies on the California model. In the 1980s, American Express joined with other companies, now more than 100, to create the National Academy Foundation. The foundation provides curriculum, technical support, and professional development for teachers. Its college-oriented, 11th- and 12th-grade academies are moving towards adding earlier years of high school and more coordination with academic classes.

Effects on Performance

Fifteen years of California studies indicate that academy students outperform similar students in their schools in attendance, credits earned, grades, and graduation rates. Although state-funded academies in California must recruit a majority of disadvantaged students, dropout rates are half the general rate. Academic improvement is continuous. Postgraduation evaluations have shown academy graduates as likely as their schoolmates to be enrolled in postsecondary schools. Both academic-track and career-academy graduates are more likely to enroll in a four-year college than general-track graduates, though career-academy students are less academically advantaged than general-track ones.

Further, academy graduates are more likely to have low-income, minority backgrounds. But this accounted for, they are more likely to graduate than other students in their districts, indicating that academies help low-income students finish high school and college. Moreover, lower academic standards are not involved in the results. Although courses within academies awarded lower grades than nonacademy courses, academy students obtained higher grades than nonacademy students. Similar results appear in studies outside California.

Self-selection, however, casts doubt on evaluations of career academies, since performance may result from the initiative or parental support of the students who choose academy enrollment and not from the academy's curriculum. Similarly, although students in small schools like academies are less likely to drop out, graduation-encouraging characteristics of the communities of the successful students cannot be ruled out as causes.

The random-assignment procedure, very rare in school-structure research, can eliminate this uncertainty. The Manpower Demonstration Research Corporation conducted a ma-

44

jor, random-assignment, 10-site study beginning in 1993. The organization created a list of career-academy applicants and randomly chose those who would and would not be admitted. The latter constituted the control group; unlike comparison groups in other studies, its members shared the experimental group's ambition and other traits.

The Manpower results confirm earlier findings: students in career academies earn more credits toward graduation and are more likely to participate in activities like volunteer projects than controls. The greatest differences are among the career-academy subgroup of students at highest risk of school failure, whose attendance, credits, extracurricular participation, and avoidance of criminal behavior surpass the control subgroup's and whose dropout rate is 11% lower.

However, the Manpower study raised two troubling issues. First, students in career academies score no higher on standardized tests than controls, suggesting that academies do not affect the best-regarded measure of learning. The earnings benefits of completing an additional year of high school have proven greater than those of one grade-equivalent year of test-score gain, so the academies' graduation-rate benefit may outweigh their lack of effect on scores. It remains unclear, nonetheless, whether the instruction is better in academies. Experimental students reported greater academic support than controls, and many developed college aspirations, but no quantitative evidence of increased learning in career academies has arisen.

Second, the Manpower study left it undetermined whether the teachers in career academies are the schools' better ones; academy teachers are not better educated or experienced, but since they are not randomly assigned, they may be superior in less tangible ways. The superiority of academy students could arise from a shift of better teachers to the academy from the rest of the school. Since only long-term performance comparisons after academy introduction could determine the impact and causes of such a shift, it may be impossible to determine how academies affect schoolwide performance.

Reconstructing High Schools

One reason why the number of career academies has grown is that they are compatible with several major high-school reform initiatives, including school-to-work, the Coalition of Essential Schools, and the small-schools movement. Like career academies, school-to-work programs like the High Schools that Work project attempt to teach career skills and prepare students for postsecondary specialization. Indeed, academies have been recognized as school reform models. Essential Schools, which focus on improving the intellectual, social, and ethical qualities of schools, have endorsed the academic quality of career academies, which fulfill many Essential-School principles, such as fostering deep and active engagement in learning, and personal relationships among students and teachers. Indeed, many Essential Schools contain career academies.

Moreover, the broader small-schools movement, now supported by federal and foundation funding, focuses on developing personal learning communities, for which career academies provide effective models. As high schools decentralize, career academies may prove useful units of subdivision. Thus, among multiple strategies for reconstructing high schools, career academies are an effective element.

High Schools to Small Learning Communities

The Manpower study, limited to career academies within high schools, cannot suggest what benefits the current transformation of large high schools into groups of small learning communities may have. Preliminary results are promising in New York, Philadelphia, and Chicago, where substantial numbers of students have been enrolled in small learning communities. Small but significant gains over traditional high-school students have been seen, such as fewer absences, higher grades, and in some cases lower dropout rates. Since the benefits of career academies may not generalize when they are instituted comprehensively, eliminating self-selection, before initiating widespread reform we should determine whether career academies and other small learning communities really do improve performance when implemented schoolwide.

Foreseeable problems of institutionalized small learning communities include loss of voluntarism, overloading the community's capacity to provide school-to-work partnerships, and the return of tracking in a hierarchy of small learning communities. Monitoring inequitable enrollment would combat this problem, as would creating career- or theme-based small learning communities to recruit teachers and students.

Conclusion

Rigorous evaluations have found that career academies within larger high schools improve academic performance and retention. Growing numbers of secondary institutions are not only adopting career academies but grouping all students and teachers into such small learning communities. Whether this larger reconstruction will have the same benefits is an urgent question for future research. As the school-to-work movement loses the attention of educators more focused on standards and accountability because of students' rising college aspirations, among its legacies will be new employer–educator partnerships and higher career awareness aligned with postsecondary goals. Combining standards with career preparation, career academies may be one of the most valuable and enduring legacies of the movement.

⌘

High Schools' Role in College and Workforce Preparation:

Do College-for-All Policies Make High School Irrelevant?

James E. Rosenbaum, Northwestern University

The struggles of youth without college degrees constitute a labor-market crisis, as they move from one dead-end job to another, unable to develop skills, status, and earnings. Employers complain that these employees lack basic skills, which must be provided on the job. Growing shortages of skilled workers suggest that educational reform must address improving the abilities and opportunities of high-school graduates. This article shows that schools have misunderstood work-entry problems by focusing on college entry and that students have misunderstood incentives for achievement. Moreover, many other nations communicate incentives effectively, and American schools could improve incentives and job entry.

Schools View Students' Problems Too Narrowly

High schools have responded to the poor labor market primarily by encouraging college-for-all policies, leading the majority of seniors to plan college degrees, even those who perform worst. However, their expectations will be largely disappointed, since only 37.6% of those planning a degree receive one in the 10 years following graduation. Thus college-for-all policies seem unrealistic, overlooking that many students are really work-bound, especially those with lower grades. Of those graduates with high-school Cs or lower planning bachelor's degrees, only 16.1% attain the degree after 10 years. Also overlooked is that many college students are not prepared—40% of seniors lack ninth-grade basic skills—and soon drop out. Despite good intentions, high-school counselors underinform students about the effort required to graduate college, encouraging their unrealistic expectations without exploring the well-paid careers, such as building trades and financial services, that would be more realistic options for many.

Furthermore, school policies focus too narrowly on academic achievement, overlooking soft skills like motivation, dependability, attention to quality, and social interaction, which many employers value above academic skills yet feel unprepared to teach. Even such a basic skill as effort remains unexercised, since students believe that academic effort bears little relation to their futures. Moreover, behaviors like absenteeism, insubordination, and incomplete work are tolerated in high schools, while employers value the opposite behaviors in young workers.

Students Need a Clearer View of Incentives

Educational policies also fail to give students a clear understanding of incentives for mastery of both academic and soft skills. Teachers are exhorted to increase students' motivation, but the rewards for such efforts remain obscure. Institutions need mechanisms for communicating the value of students' actions for college and career goals. Instead, schools often indicate that school behavior is irrelevant to immediate goals, since colleges' open-admissions policies allow even weak students to enroll. Further, employers ignore high-school performance records in hiring, partly because they do not consider them trustworthy or cannot obtain them. Instead of using high-school performance in hiring decisions, they limit graduates to entry-level work until they prove themselves. As a result, students cannot tell if or how their goals are attainable.

Incentives in Other Nations

Many other nations provide clearer incentives for achievement that Americans could use as policy models. Their educational systems clearly link school performance and career outcomes. In the German system, for example, work-bound students strive for apprenticeships that lead to respected occupations, knowing that secondary-school grades affect selection for those opportunities. Afterwards, apprentice certification gives German youth a sense of accomplishment rare for U.S. youth. Unlike our unemployed graduates, unemployed German apprentices feel unlucky, not incompetent. Similarly, in Japan, high-school grades are linked to entry into respected occupations for the work-bound. If their achievement is too low for their goals, Japanese students know it in advance and see reasons to increase effort or lower expectations.

Improving Labor-Market Entry Policies

MAKING ACHIEVEMENT RELEVANT TO GOALS

U.S. schools already have a system, College Board Testing, linking academic achievement to goals on the foreign model, but it only extends to the minority of students aspiring to selective colleges. Test results inform high-achieving students well before graduation of the likelihood of admission and of the need for increased effort. Low-achieving students, who typically aspire only to open-admissions institutions, lack such incentives, which apprenticeships or more rigorous college admissions standards could provide. The perceived gap between high-school performance and job success could also be bridged by educating students about research showing that better high-school grades and soft skills predict better earnings. A rise of one letter grade (from C to B) is associated with a 12% earnings gain 9 years after high school, and soft skills like attendance, deportment, sociability, and leadership also improve earnings.

Further, high schools could link job-finding aid to achievement and inform students about research that indicates that job entry through a school contact increases nine-year earnings potential by 17%. Counselors and other educators should stop keeping students in the dark about the consequences of their performance, even if they withhold information only to be kind to students or to placate parents.

IMPROVING COLLEGE AND EMPLOYER CONTACTS

Improved student contacts with colleges and employers can clarify incentives for achievement. Two reforms have been promising, despite difficulties aligning these high-school experiences with later demands. First, tech-prep programs articulate junior and senior year curriculum with community-college technology programs, teaching students about college and occupational demands and making for a seamless college transition. Tech-prep success indicates a that a student is prepared for college, and failure motivates efforts to improve and to adjust goals. Unfortunately, existing tech-prep programs often have below-standard requirements, leaving students ignorant of college-level demands. Further reform should focus on integrating those demands into the preparatory curriculum.

Second, youth apprenticeship and cooperative learning (co-op) programs give some students the work experiences they need to improve their chances for success in the labor market. Apprenticeships coordinate school and workplace learning under close supervision. However, they are so expensive that few U.S. employers are willing to contribute to funding for them. In co-ops, sometimes seen as inexpensive apprenticeships, students are released from some classes to work in positions that ideally provide more training than average jobs. In practice, however, co-ops *are* average jobs with little training and few postgraduation opportunities. While apprenticeships increase a student's earning potential, co-ops usually do not, unless students are able to secure jobs at the same company that provides their co-op experience. These potentially useful programs could be improved through expansion, increased quality, better training, and improved communication of a given student's job readiness.

IMPROVING SIGNALS OF STUDENT VALUE

Unlike Germany's and Japan's, our high schools do not clearly convey graduates' readiness for college or employment. Several policies could begin to solve that problem. First, colleges involved in tech-prep could adopt standardized placement tests of college readiness. Well before graduation, these tests could indicate academic quality clearly to high schools, colleges, and students themselves, allowing time for backup plans. Second, high schools could provide employers with better signals of soft skills. Indeed, by reflecting attendance, discipline, and motivation, grades already do this to some extent, and further signals of student qualities could be developed. Some high schools have already created employability ratings tailored to employers' needs, and these schools have reported increased student motivation. Further research on the effects of such ratings is needed.

Third, high schools could build more trustworthy employer relationships, for instance through vocational teachers, so that the best-qualified students could more easily be hired. Employers indicate that such relationships aid hiring and give them dependable information. Unfortunately, however, connections between schools and employers are still unfortunately rare; only 8% of seniors get jobs through school contacts, despite the clear advantages. Hiring through contacts may limit the applicant pool, but large applicant pools do not help employers if they cannot assess applicants' quality. Hiring selectively seems preferable to hiring randomly. Teachers can build relationships through trade experience, careful applicant screening, and candor.

Employers and teachers should establish reciprocity, so that both parties value the relationship for meeting mutual needs and not for extrinsic benefits, such as teachers pleasing administrators by placing weak students or businesses improving public relations by extensive co-op hiring. When extrinsic benefits are central, teacher–employer relationships have little reason to develop. In such cases, sacrifices for reciprocity's sake, like better student screening despite administrators' demands and more intensive yet less visible apprenticeships, could establish the trust needed to foster the relationship.

Conclusion

Unfortunately, current policies work against improved school–employer contacts, since vocational programs and their well-connected teachers are being curtailed in favor of college-for-all policies. To reverse this trend, vocational education should expand in high schools and community colleges. Teachers with good trade contacts should be retained and rewarded for making good placements in industry and colleges. Teachers and counselors should also be encouraged to give employers candid information about students and to be forthright with students about their abilities and opportunities. These policies could encourage employers to see high schools as valuable sources of hiring information.

Other steps could include acquainting counselors with noncollege options and evaluating students' college and career abilities more accurately and consistently. The underlying conditions for such policies are present; the key is making the institutional actors aware of the importance of improving students' opportunities for job-entry success.

⌘

Is the School-to-Work Movement on the Right Track?

Robert I. Lerman, American University

In the late 1980s and early 1990s, policymakers debated the employment and wage problems facing work-bound youth and the weak skills of American workers. Interest in formal school-to-work (STW) transition programs on the European model grew, leading to a proposed 1992 Youth Apprenticeship Act, state STW initiatives, and the1994 passage of the School-to-Work Opportunities Act (STWOA) granting states federal funds and STW guidelines. Like the 1994 National Skill Standards Act (NSSA), which formed a board to develop skill standards and STW goals, STWOA represented a rapid transformation of problem to policy.

However, the expectations for an effective STW system have gone unrealized, as government interest in education moved elsewhere despite growing business interest in STW. Another problem has been emphasis on moderate interventions for all students instead of intensive approaches for some. This article discusses motivations for the STW movement, failures in intensive programs and skill standards, and results of research on STW initiatives. It argues for an apprenticeship system and recommends redirecting the movement towards its original goals.

STW Policy Motivations

Among motives impelling STW policy, central was the need to improve opportunities for youth who would not graduate college. Over the past 15 years, it was recognized that both their educational and labor-market problems needed attention. As demand for skilled workers increased, young people's abilities fell, foreboding earnings decline for those without adequate skills. The perception of weak skills led employers to lower expectations, reinforcing difficulties in finding satisfactory work and stimulating youth job-hopping and unemployment. In response, schools invested more in improving academic outcomes, with mixed success. Pointing out that motivation is important in raising performance, STW advocates proposed that helping students see the relation of school to careers would boost motivation. Thus they favored teaching subjects in a real-world context.

Meanwhile, though job-training programs targeting disadvantaged youth showed little effect on outcomes, broader STW programs promised to academically motivate at-risk students at all socioeconomic levels. Further, weaknesses in vocational programs led to scaling them back in favor of college preparatory or alternative programs with career components, including career academies and apprenticeships.

By the early 1990s, international models led policymakers to believe that the STW transition could be improved by establishing career-related standards and especially by intensive work-based learning (WBL) culminating in occupational certification. A WBL system would clarify reasons for educational effort, provide contextual learning instead of fragmented knowledge, improve links between training and career standards, and expose at-risk youth to constructive peers and adult mentors. The system would also give portable skill credentials, increase productivity and income, provide disadvantaged youth with formal access to good career opportunities, and reduce crime and premarital parenthood by offering incentives for avoiding these dangers.

Reformers believed that these advantages would flow from systemic change, not from separate local programs without intensive involvement. Instead, however, low-intensity, local programs have characterized the STW movement. How did STW policy fail to achieve systemic change?

Failures of STW Policy

As the process of shaping the STWOA unfolded, tensions arose over the extent to which the government would direct policy and endorse an intensive, apprenticeship-style system. Labor worried that weak standards would devalue registered apprenticeships. Many policymakers worried that apprenticeships would track students, limiting college opportunities; would be too demanding for the academically underprepared students who might be the most interested; and would yield too few job openings. Further, concerns about too strong a federal role while government was downsizing led to adopting procedural, not substantive, requirements.

Consequently, the final act emphasized career majors instead of youth apprenticeships, leaving the nature of the WBL recommended unclear and its implementation in the states' hands. Confusingly, the act stipulated an industry-recognized skill certificate that could connect with national skill standards. The act articulated too many goals, recommending a national framework, portable credentials, and school-based career activities, but also local STW partnerships with relative autonomy. Was the act to benefit all students or just the work-bound? Was its chief goal to improve instruction, increase college attendance, or ease STW transition? Governance was too divided among government leaders, educators, and private-sector leaders who could most effectively implement WBL.

A key failure stemmed from emphasis during the first, eight-state funding phase on including all students in STW instead of on developing WBL. Consequently, officials concentrated on career exploration instead of career experience. To avoid limiting STW initiatives inequitably to the work-bound, states centered initiatives on school-based, exploratory activities like job-shadowing and career-awareness training unrelated to specific vocational preparation. Meanwhile, the failure of NSSA to create national skill credentials or to integrate them with STW made the STWOA stipulation that students master certifiable skills impracticable.

Results of Research on STW Initiatives

Some states have nevertheless successfully given priority to intensive WBL initiatives. Wisconsin has developed 20 skill standards in varied fields, each based on rigorous academic and work competencies delivered through technical colleges or apprenticeships, which have been limited mainly by high schools' unwillingness to support participation. Research conducted by Jobs for the Future (JFF) shows that efforts to make learning more work-based have struggled against perceptions that participants would learn less and be less college-ready. Some cities succeeded in promoting WBL widely without linking STW too closely with stigmatized vocational education.

However, the nature of WBL in the JFF research is unclear, and evidence for academic gains reported is undercut by the lack of comparison groups. A Mathematica Policy Research study of initial implementation indicates that education–employer partnerships grew and STW participation rose for all students from 1996 to 1998. But students participated mostly in low-intensity activities; only 3% participated in both a career-focused school program and WBL.

National STW evidence from the 1997 National Longitudinal Survey of Youth (NLSY97) demonstrates that STW is hardly universal; only 14% of schools offered apprenticeships, only 64% any STW program. The link between school and student reports on STW participation is surprisingly weak, with participation reports almost as high in schools not reporting STW as in involved schools. Fewer than 5% of high-school students reported apprenticeships; they were likely to be African-American, low-income, and work-bound students. The author's analysis of NLSY97 and its 1998 follow-up shows over 30% of students involved in a WBL activity, but 38% of those had worked no WBL hours in the previous year, while only 20% had worked over 100 hours.

Negative trends in WBL involvement should not all be attributed to STWOA failures, since the act did stimulate career-oriented activities just when traditional vocational education declined. The act's stress on academic achievement as occupationally important aligns with this trend, but it remains unclear how STW activities will surpass the vocational education they replace. Overall, STWOA has stimulated more school–employer interaction, created substantial WBL opportunities, and motivated students, without, however, creating an STW system that would establish new routes to rewarding careers for the work-bound.

The Case for Apprenticeships

Opposition to an apprenticeship-style system is based on a misunderstanding of egalitarianism. An appropriate egalitarianism requires equal opportunity but not a single pathway to success. Requiring those more capable in less academic settings to compete academically reduces equality and creates frustration in schools and the labor market. Research also argues for an apprenticeship-style system, showing that, in developed nations, apprenticeship entry to skilled careers for low-income students is the best educational route to success and social mobility. While vocational stratification can limit educational opportunity, it protects occupational opportunity, since few vocationally stratified students drop out without marketable skills. Further, employer-based apprenticeships yield considerably better outcomes than school-based training.

Another argument remains against employer-based apprenticeships. Human capital theorists argue that since apprenticeship benefits accrue primarily to workers, especially if they change firms, employers have little incentive to offer the training.

However, other theorists have countered that productivity gains through low turnover likely in a highly skilled labor market (since negative perceptions about skilled workers who change firms make change risky) may outweigh employer losses in wages, allowing for economical training. Moreover, an apprenticeship system seems practical now in the U.S., especially since many jobs require skills not taught in college and many students will not complete college.

Conclusions

Other nations have shown that successful apprenticeship programs demand widespread reform. To initiate reform, three concrete steps could be taken.

- Lead industries could model a STW system, create standards, and work with educators on training delivery. Hiring incentives could attract participants, and benefits of these initiatives could be assessed.
- Governments could designate occupations for training models, develop standards in these areas, involve schools, and offer internships. This program could raise government workers' quality and build private-sector trust in governmental commitment to reform.
- Regional skill certification could be promoted to document existing standards; develop consensus about new ones; and coordinate standards across industries, regions, and postsecondary institutions.

Further steps to reform STW transition could also be taken. Whether apprenticeship initiatives are the focus or not, it is crucial to rethink the goals of STW for the 21st-century workforce.

⌘

What's Next for School-to-Career:

An Assessment of Progress and Prospects

Richard Kazis and Hilary Pennington, Jobs for the Future

After a decade's progress, the school-to-career (STC) movement stands at a crossroads. With federal support, many schools have developed successful programs using contextual, career-based learning to prepare students for new workplace challenges. However, since federal funding for STC is ending, it is imperative to develop strategies for progress based on what has been learned so far. Jobs for the Future has undertaken an inquiry into the future of STC. This paper reviews the results of that inquiry, focusing on the evolution, strengths and weaknesses, and future prospects for STC.

The Rise of School-to-Career

The STC movement was propelled in the late 1980s by concerns about American youth's educational and economic prospects, including poor high-school quality, the need for better workplace preparation, and student disengagement from studies and the adult work world. By the early 1990s, consensus had emerged on the need for reforms guided by the following tenets: (a) young people need more help successfully moving to the increasingly complex career world; (b) effective solutions must address education and careers through contextual learning, work-based learning, and career exploration; (c) schools must enter new relationships with community and business partners; (d) reform must go beyond innovative programs to districtwide approaches; (e) given our national political context, reform must be initiated by states, localities, and private-sector leaders, supported but not governed centrally; and (f) gradual and flexible implementation is preferable to top-down national programs for meeting local needs. This consensus informed the 1994 School-to-Work Opportunities Act (STWOA), which committed more than $1.5 billion in federal support to states for STC development between 1994 and 2001.

The broad reach of STWOA created difficult implementation choices for practitioners. Implementers had to decide whether reform was directed to all students or just those not college-bound; whether initiatives should focus on high-school reform or broaden to K–16 education; whether improved classroom practices or work experience was more important; whether reform should focus on school or employer activities; and whether governance and accountability should rest with schools, employers, or government. Competing responses resulted in great variations in implementation. Lessons emerging from these reform experiments allow us to assess the STC movement's strengths and weaknesses.

School-to-Career Today: Progress and Challenges

Although STC programs are improving many students' learning, the movement's profile as a reform strategy has receded, for reasons that analysis of its implementation clarifies. Federal STWOA funds, which distributed across 50 states amounted to only $4.32 per K–12 student for the 1997–1998 fiscal year, have been broadly invested in establishing school–employer partnerships and expanding school-based career activities. Some states have changed patterns of STC policy in lasting ways. Numerous initiatives have improved student attendance, coursework rigor, retention, college-attendance rates, and first-job wages.

However, implementation of STC policy has been slow and uneven, with some communities investing too much in isolated activities having little impact. Given the complexities involved, the temptation to spread resources, and the short time for showing results, such slow progress is understandable. It provides warnings and hope for continued implementation.

PROGRESS

Several key benefits deserve highlighting. First, *employer engagement* has increased steadily, involving about one fourth of U.S. firms in partnerships and one third in work-based learning. This participation has given many students access to better work and training while furnishing employers with a more stable youth workforce. Second, *local partnerships* were created, led by public-school and postsecondary educators as well as private-sector leaders. These collaborations have facilitated creative, effective STC activities in communities across the nation. Third, the *number of students involved* has grown significantly, with STC activities becoming as common among seniors in college-preparatory curricula as among others. Involvement in intensive, work-based programs has attracted more work-bound students, and participation in career-related classes has risen dramatically among African Americans.

Fourth, *student satisfaction* in STC has risen, especially for individualized experiences like job-shadowing and internships which give them contact with workplace mentors. Fifth, STC participation has *increased the likelihood of college attendance* among minority and disadvantaged youth. Finally, involvement has *increased motivation*, as STC students choose more college preparatory courses, attend more regularly, and spend more time on homework than their peers. However, improvement on standardized test-score indicators of academic progress has not been clearly demonstrated.

CHALLENGES

If the positive outcomes associated with STC participation do not account for the relative weakening of STC as a national reform strategy, then what does? Research and experience suggest four contributing factors. First, *shifting political realities* have undercut the movement, as attacks from the right, resonating with parental fears about tracking and choice reduction, weakened political support. Second, the *complexity and ambition* of envisioned reforms have been a significant obstacle. Integration and assessment of efforts to link school- and work-based learning have understandably involved costly planning and experimentation. In some communities, complexities and restraints on resources have prevented movement from planning to implementation.

Third, *implementation choices* have unintentionally weakened public support and effectiveness. In some communities, STC was implemented as a K–12 initiative focused on elementary students, which limited the opportunities available for secondary students. Given the short lifetime of funding, moreover, implementers rushed to measure results, making scale, not quality, the chief measure of early success. Consequently, districts frequently favored less intensive activities such as career fairs and job-shadowing days for which quantitative results were easy to deliver. Further, reformers employed a rhetoric that STC activities should be for all students, a laudable idea but one that drew political opposition on the grounds of limiting young people's choices.

Fourth, STC initiatives have become increasingly *isolated from standards-driven reform*, the decade's dominant reform effort. No inherent conflict exists between standards and STC reforms, since STC activities provide motivation and instructional strategies that many see as essential to raising standards. But competition for resources, limited evidence of academic achievement gains, and the housing of STC governance not in curriculum and instruction but in vocational education offices pitted the movements against each other. Moreover, the connection of standards to testing made it hard to integrate STC's contextual approaches to learning with test-focused, core-subject instruction. As pressure to produce higher scores grew while few results demonstrated that STC involvement improved achievement, states and districts saw incorporation of STC strategies into the curriculum as a high-risk approach with little guarantee of success.

The Future of School-to-Career

Paradoxically, as federal support wanes, enthusiasm for high-school reforms linking education to careers waxes. School–community partnerships are growing, and career-based learning communities in larger high schools are expanding. There is reason for long-term optimism, since the task of schools in the future will be to help students master the knowledge that will increasingly lie at the heart of work. Hence contextual, experiential, and work-connected schooling is likely to become less controversial. The challenge will be to develop strategies to transform schools effectively and equitably to structures that can promote the development of the range of skills needed for success in today's economy.

Several developments might kindle renewed interest in STC approaches in the coming years: (a) crises in high-school achievement and college retention, which could encourage experimentation with alternative structures and pedagogies incorporating STC elements; (b) recognition of the limits of standards-driven reform strategies at the high-school level may have the same effect; and (c) employer interest in certification of work-related competencies might spur curricular and pedagogical reforms.

However, significant hurdles stand in the path of these developments, not the least of which is the winding down of federal support for STC. In 1999, Jobs for the Future made a series of recommendations for sustaining STC as the STWOA began to sunset. It was urged that stakeholders support leading innovators, focus on academic outcomes and long-term postsecondary results, strengthen school–employer partnerships, reach out to potential allies in higher education and in alternative schools, and provide support for a nongovernmental research and documentation center for STC service.

Here the authors propose five strategies that can help STC survive, grow, and rebuild in the long term. First, stakeholders should *focus on high schools*, especially urban ones, to help students cross the school-to-work bridge. Second, they should *focus on postsecondary connections*, establishing creative partnerships linking high-school and college curricula and sharing STC pedagogies to combat college attrition and address employer needs. Third, they should *promote STC principles within other reform movements* with common interests such as career academies and the Workforce Investment Act's youth programming and planning. Fourth, they should *fund long-term community partnerships* at the local level that connect schools and employers. Finally, they should *fund research to improve design and implementation*, focusing on long-term achievement and alternative measures of nonacademic skills to substantiate the case for STC reform.

These strategies, in sum, can promote the STC agenda by sustaining successful efforts, improving quality, and demonstrating results. STC progress need not end with federal funding, though it will take time before these concerns and strategies move once again into the educational mainstream. Hard—and strategic—work to replace that support within communities can accelerate the pendulum swing back toward STC principles and practices in our high schools.

⌘

A Melding of International Perspectives on Vocational/Technical Education

Robert Zemsky, University of Pennsylvania

American educators usually look to the success and openness of our institutions for policy guidance. However, crises occasionally lead us to look abroad for solutions, which happened in the 1980s and 1990s, when math and science achievement and youth workforce preparation fell well below international standards. The 1990 report, *America's Choice: High Skills or Low Wages*, argued that America could learn about youth training from models like Japan's on-the-job training and Germany's apprenticeship system. Leaders of the national school-to-work (STW) movement sent study teams abroad for solutions, sometimes overlooking foreign training systems' problems.

However, the economic boom of the later 1990s has weakened motives to reform workforce preparation. STW programs have provided some career education, yet vocational training has continued to dwindle to an opportunity limited to weak or disadvantaged students. Today, most American youth find rewarding occupations independently, combining job and educational experience into a viable career path. Meanwhile, other countries have begun to question their training systems and to look elsewhere for successful models.

One result was a multinational study of vocational/technical education sponsored by the University of Pennsylvania. The study undertook weeklong visits to communities in four countries: the United States, Singapore, Switzerland, and Japan. A research team, including a senior scholar from each country and a senior Swiss government official, organized individual and group interviews led by the country's senior scholar. Interviews took place at several locations at each site: two companies, two vocational/technical education providers, two secondary schools focusing on work-bound students, and two focusing on university-bound students. Teachers, students, managers, and young workers were interviewed. Fieldwork began in 1997 in the U.S. and ended in Japan in 1998. This paper reports on the issues for each country's vocational/technical programs, offering conclusions on the status of those programs, which face the worldwide college-for-all trend.

The United States: Lehigh Valley, Pennsylvania

Unlike the other countries, the United States lacks a single, historically based educational vision and is characterized by rapid economic change, as evidenced in the Lehigh Valley's decline in manufacturing and the youth population. Young people often leave the Valley to seek educational and economic opportunities elsewhere. As in the rest of the nation, this area's retention and college attendance rates are rising as the perceived value of college education rises.

The study group arrived at several generalizations about vocational/technical education and the STW transition in the Lehigh Valley and most of the country. First, while college ambitions rise, vocational education is becoming less formal and more attuned to the area's growing service economy. This has led to anger among local manufacturers, who feel schools are not preparing enough students for the work they offer. Second, vocational training faces a growing stigma associated with skilled labor and manufacturing. While the social role of vocational training diminishes, local manufacturers show little responsibility for the success of vocational schools. Third, Lehigh Valley vocational/technical programs offer much more occupational choice than do programs in other countries, and most students receive little occupational training before graduation. The national trend towards college education, related to technological advances and global competition, remains in conflict with the needs of this local economy.

Embodying the conflict is the requirement that vocational-track students take morning high-school classes before traveling to vocational school in the afternoon. Meant to prevent segregation of vocational students, the move merely makes them seem less accomplished than their academically tracked peers. Yet at the vocational school, they seem quite capable and proud of their achievements. The divide between vocational students and others represents a prevailing national attitude that defines good jobs as professional and stigmatizes even highly skilled labor as demeaning.

The City-State of Singapore

A blend of Asian and British culture, Singapore's planned economy manifests competition and a strong work ethic. Education, conducted in English, is universal. At each level, rigorous testing determines a student's educational path. After passage of the British O-level exams, the most advantaged track leads to junior colleges and thence to universities. A second track leads to one of the country's polytechnics, which prepare students for occupations requiring advanced schooling but not a university degree. For those adept in math and science but not English, this provides an alternative to O-level English difficulties.

Finally, many students are tracked into the Institute for Technical Education, which both trains technical and mechanical workers and acculturates the large number of non-Singaporean workers. While as an importer not an exporter of youth and talent, Singapore differs from the Lehigh Valley, both areas share a growing college mania and attach stigma to vocational/technical education.

This context frames several key features of Singaporean attitudes towards vocational training. First, the testing and tracking system puts enormous pressure on youth not to disappoint by scoring low on the clearly hierarchizing exams. Second, expectations for those tracked into the Institute for Technical Education are quite low, though the institute provides a sophisticated vocational program. Through this study, Singapore was looking for ways to improve the status of the institute. Third, Singapore increasingly offers second-chance routes out of institute enrollment and into polytechnics and then universities, but these routes further lower the status of the institute.

Finally, Singapore provides few work–school links; at all levels, work socialization takes place only after full-time work begins. Especially at the top, this causes problems as school competition gives way to work cooperation. Perhaps the country should consider planning more youth work opportunities, which market forces do not create as easily as in the United States. In the future, Singapore's educational system will probably remain controlled and competitive, and the prestige of vocational/technical education will rise only with difficulty.

Switzerland: St. Gallen

Switzerland boasts one of the world's oldest and most respected apprenticeship systems, involving employer–state partnerships, for much of its youth. The employer largely pays for training in exchange for the worker's labor in the final, productive apprenticeship year. Historically, prestigious careers have begun with apprenticeships. This system is now under pressure, as many Swiss enterprises have joined multinational corporations, while the country imports more non-European immigrant workers. Leaders worry that if immigrants' children increasingly dominate the apprenticeship system, it will seem less desirable to natives. This admired training system is not immune to the prevalent stigma on vocational/technical education.

Swiss education reflects worldwide socioeconomic trends. Swiss youth associate university education with social status and economic mobility, which are increasingly linked with ethnic identity. Competition for university entrance and the most desirable apprenticeships will likely increase ethnic conflict. Moreover, Swiss economic restructuring is redefining work. The study revealed that apprenticeships do not teach technical skills that firms see as essential for future success in the global market. Even in banks, where apprenticeships have been prestigious, managers expect to hire more university graduates with sophisticated financial skills.

Thus the apprenticeship system is being squeezed above and below, as large firms question their commitment while small firms become less able to provide skills for the changing economy. If the trend towards university study continues and traditional work acculturation withers, how will the country prepare its youth for work? If university-bound youth are given more part-time opportunities before graduation, that may accelerate ethnic differentiation. However, Switzerland possesses the resources and experience to solve such problems.

Japan: Hamamatsu

Like its economy, Japan's educational system is in turmoil, largely because of a population decline halving the number of students graduating from high school and lessening university placement competition. Thus a system thriving on competition is left without motives to compete. Meanwhile, a new trend towards youth job-shifting makes it likely that Japanese firms will invest less heavily in on-the-job training than in the preceding era of lifelong employment.

The Hamamatsu study added insight related to vocational/technical education in relation to these trends. First, Japanese students seem less motivated to excel and more willing to choose less demanding educational and occupational paths. Second, youth job-shifting seems motivated by increasing self-interest, as career advancement replaces loyalty as a key concern. Third, Japan's formerly strong vocational secondary system now seems a weak alternative to the academic-track system. The schools seem more notable for cocurricular programs like sports than for good technical training. Fourth, young people place unexpected emphasis on collecting special educational credentials piecemeal instead of developing skills comprehensively.

Finally, the link between employment and university education remains unclear. Perhaps because top universities emphasize graduate research training, students have little idea of what, beyond scientific and technical knowledge, universities give them for workplace success. Mitigating such concerns are the skill, energy, and discipline that still characterize Japanese students, even as they struggle with their country's large-scale changes.

Conclusion

This multinational study suggests that the quest for higher education has become universal in industrial nations, at the expense of vocational/technical education, which has been stigmatized as the educational path for immigrants and the disadvantaged, further widening the economic gap between the university-educated and others. College mania threatens to overwhelm traditional means of training skilled workers, whether in vocational schools or apprenticeships. In the future, countries should heed each other's solutions to this problem and respond to market trends that make current policy regarding vocational/technical education increasingly irrelevant.

⌘

Tomorrow's Workforce Sits in Today's Classrooms:

School-to-Career in Philadelphia

Mary Jane Clancy, Melissa Orner, and Rico Rodriguez, School District of Philadelphia, Pennsylvania

Since 1992, school-to-career (STC) reform in Philadelphia has involved hundreds of business and community partners in improving the district through systematic efforts to link schools to the city's economic and community development needs. This report describes the history, components, assessment, and prospects of Philadelphia STC.

History

In 1994, the new district superintendent developed a 10-point reform plan, Children Achieving, for a district plagued by low achievement, social problems, and negative community image. The plan focused on improving all students' achievement in this largely minority, low-income district, the country's fifth largest, through reforming instruction, restructuring, and connecting the district to the local workforce. In 1996, the district established a federally supported STC initiative to build that connection. Business, community, and city leaders developed STC policy and linked it to broader economic initiatives. A workteam of educators headed implementation and evaluation.

Components

Philadelphia's STC system encompasses six key components.

- *Resource Boards* led by major employers coordinate efforts, leverage resources, and provide opportunities for city youth. Each board works with one of 22 geographic school "clusters" to improve attendance, increase opportunities for work-based learning (WBL), and build new schools.
- *Instructional Change* includes STC competency as a district standard and projects as a requirement for promotion and graduation. Extensive professional development is provided in STC-related methodologies. High schools have been restructured into Small Learning Communities (SLCs), most with career-related themes. An interdisciplinary teaching team works with the same students all four years, linking instruction to career themes and WBL.
- *Stakeholder Partnerships* led by industry executives link the city's growth industries to schools. Partnerships advise SLCs, offering teacher professional development, increasing student STC activities, and adjusting curriculum to industry standards.
- Partnerships have created *Work-based Learning* experiences for 3,000 juniors and seniors. Trained worksite mentors and individualized learning plans connect workplace experiences and class instruction.
- A *Service Learning* requirement for all students combines problem-based learning with career exposure and connects with a citizenship requirement.
- To *Reach All Students*, the district has initiated educational planning and WBL programs for special education and alternative students like dropouts and the formerly incarcerated.

Assessment

Controlled district assessment and independent researchers have concentrated on WBL, which provides isolable data. A comparative study of 440 WBL-participating graduates showed better attendance, graduation rates, and GPA than similarly achieving nonparticipants. Longer WBL placements had greater effects. GPA rose significantly for those reporting negative peer influences. A similar 1997 postgraduation comparative survey of WBL participants showed more WBL participants reporting good employment preparation. Many received job offers from WBL employers, and most rated their WBL highly. Employed WBL graduates were more likely to be working in chosen career areas. Participants felt as prepared for college as others and were attending college comparably.

Other studies have shown that WBL keeps special-needs students attending school and employed after graduation. Teachers rate STC highly. Evidence of STC success lies in the success of Children Achieving reforms, to which STC has been integral. District test scores have risen steadily for four years, and the first elementary cohort benefiting fully from reforms improved markedly in eighth-grade achievement in 2000. High schools have also improved, as graduation rates have risen between 1996 and 2000. Further assessment is planned, focusing on effects of Service Learning and WBL on postgraduation outcomes.

Prospects

Theory suggests that major reform is easier when change has reached a critical "tipping point," so district STC policymakers and practitioners should focus on finding tipping points crucial in changing professional and public perception. Though community support for STC reform is strong, it could be better harnessed. Most Philadelphians surveyed agreed that public schools should prepare students for careers through internships, mentoring, and school–business partnerships. Their support of STC urges practices that exceed tipping points and sustain districtwide career preparation. Service Learning, which integrates students and community, should expand, as should WBL, which helps change workplace perceptions of students.

A change of leadership makes the future of Philadelphia STC reform uncertain. But the Workforce Investment Act aligns youth workforce development with academic achievement, and the new district administration supports business involvement, so further reform seems likely. An intermediary organization coordinating partnerships with business also promises to foster district STC reform.

⌘

School-to-Work in Middle Schools:

Right Track and Fast Track Programs

Shellonda Rucker, Tallahassee School District, Tallahassee, Florida

Work-based learning (WBL) yields benefits that classroom education alone cannot provide. In Tallahassee, Florida, two middle schools established two WBL programs, one for at-risk eighth-graders, Right Track, and the other for accelerated learners in that grade, Fast Track. This report describes the programs, their WBL activities, and their successes, problems, and solutions.

Programs, Participants, Curriculum

The initiatives were instituted at middle schools serving about 700 students each, mostly inner-city Black youth. Most students are poor and disadvantaged in other ways; 18% report family incarceration. Most are minority students, and most are female. However, both programs strive to blur socioeconomic lines, focusing on building academic, work, and life skills.

In Right Track, 60 students with low socioeconomic status and academic and behavioral difficulties, sometimes including prior arrests, receive support for successful performance. Grant-funded by the state justice department, Right Track seeks to keep high-risk youth out of the justice system. Participants receive training in employability, career exploration, interviewing, gender equity, and time management. Those maintaining a 2.00 GPA and improved discipline and attendance move in February to internships in occupational fields of interest.

In Fast Track, 35 more capable yet often underachieving pupils work to complete core-subject requirements by March, supported by teachers, peer collaboration, and independent study. They receive work training similar to Right Track students'. If they complete core subjects with a B grade, they gain internships in chosen career fields. Internship qualifications include meeting disciplinary standards, completing resumes, and submitting recommendations.

Curriculum integrates workplace competencies with core subjects through thematic units. For participants, 4 hours of after-school meetings weekly expand workplace knowledge. Tutoring is offered. At both institutions, programs are integrated with regular schedules, except for program-related Fast Track field trips.

Work-based Learning

Community partners provide internships and mentoring time. Partners include government agencies, universities, and small businesses; they sponsor field trips and guest speakers before moving on to internship commitments. Partners are chosen on the basis of students' career goals, ranging across medical, legal, educational, public service, and business fields.

Right Track students intern for 16 weeks, working 3 hours for 3 days weekly; 2 days they receive after-school tutoring. Stipend rates depend on school performance and work evaluations; students earn up to $450, paid biweekly. Fast Track interns work up to 20 hours weekly for 8 weeks. Their work is scheduled around classes. Students are regularly evaluated on job performance. They receive up to $295 when the internship ends. Earnings differences stem from the programs' different funding sources. Grant-funded Right Track enjoys more support, partly because students' needs are greater. Fast Track, supported only by school improvement funds, has more limited support.

Successes

The programs have motivated underprivileged students to meet Florida performance standards. Administrators created annual objectives for Right Track participants: that under 10% be arrested, 75% avoid suspension or expulsion, 70% attend school at a 94% rate, 80% earn at least a 2.00 GPA, and 80% move to internships. In three funding years, all objectives have been met except the last, because too few internships could be found.

Fast Track success stems from completed internships and positive student responses. In the past two years, 87% of these students have experienced internship rewards, learning enough to decide whether to pursue career paths. Another sign of success is sustained business–community involvement.

Problems and Solutions

Although successful, the programs have encountered problems. The original program coordinator was unable to meet the heavy workload demands. Students dropped out, objectives went unmet, and the coordinator eventually resigned. Hiring a coordinator successful with the programs' typical students, an internship aide, and local university interns interested in criminal justice solved the problem. Work transport also posed a challenge resolved by providing passes and training for students to use public transportation. As an alternative, the programs leased a minivan. Transportation costs totaled only $8,000. Finally, improving low achievement without sacrificing program opportunities proved difficult. Since both program activities and remediation were scheduled immediately after school, program participation lagged. The coordinator recently decided to incorporate remediation into regular meetings; results remain unclear.

Future

Tallahassee should continue supporting these programs that benefit both students and community. The coordinator hopes to gain continued school-district funding and grants for staffing and stipends, now that grant support has ended. Plans also include adding success-assessment data like student statements and standardized test scores in order to gain even greater support for sustaining the programs.

⌘

School-to-Work at Marshfield High School

Arnold L. Roblan, Principal, Marshfield High School, Coos Bay, Oregon

Marshfield High School (MHS) in Coos Bay, Oregon, has undergone a school-to-work (STW) restructuring since the 1991 Oregon Educational Act for the 21st Century established Certificates of Advanced Mastery (CAMs) for seniors and other reforms. The certification program identified basic STW components and six occupational focus areas for school restructuring. This report explains the context, restructuring, programs, and results of reform at MHS.

Context

The school is located in a small, Pacific Coast town in rural, economically depressed Coos County, which has little diversity or industry, great mobility, and a traditional reliance on the declining lumber and fishing industries. District poverty is reflected in reduced or free lunch eligibility: 31.64%. In response to area economic needs and government initiatives, the district strove to give every student career exploration and work-based learning experiences.

Restructuring

Guiding principles included coordinating state and district goals, serving disadvantaged students, aligning programs with staff strengths, providing professional development, stressing work-based curriculum and school enterprises, and using community resources. Accordingly, departments were reorganized into CAM strands linked to focus areas. Teachers chose strands, and inservice training was provided. Counselors instituted educational plans for students. Every class introduced STW principles; teachers were encouraged to create school enterprises and course work experiences. For all strands, MHS instituted community career-education experiences, for which learning managers and students developed work-based study programs.

Programs

Each focus area involves successful STW activities, including CAM courses and school-based enterprises. The *Arts and Communication* area encompasses the most students and programs. Highlights include a nonprofit radio station, a professional television course, and integration of the school newspaper with the local one. The *Business and Management* area includes business courses, a school store for at-risk sophomores, and business partnerships. Special-education students participate in a work-skills program to prepare for summer employment. Other students manage an in-school bank branch and work as school-district secretaries.

In *Health Services*, instructors place students in medical work, for which biology and medical-terminology courses prepare them. Students in *Human Resources* may coenroll in a community-college early childhood program, study psychology, and assist community social-service agencies. Or they may participate in a cadet-teaching course, working daily with district teachers and recording their experiences in an e-mail journal.

The *Industrial Engineering Systems* focus provides a block of math, science, and technology classes. Students use computer-assisted drafting, invent projects, and visit high-tech worksites. Alternatively, students can follow a computer-networking program resulting in A+ certification. A *Natural Resource Systems* block allows pupils to learn riparian zone analysis skills transferable to government work. They collect, analyze, and report on physical and biological data, sharing results with local landowners. A related estuary studies course focuses on chemical and bacterial analysis. In this course, students apprentice in the summer with local scientists.

Other programs include business-sponsored professional development providing educators with work-based learning relevant to their teaching. Activities include a symposium featuring practical activities related to workplace issues and cooperation with business leaders on evolving classroom activities. Teachers can also visit local medical facilities, where they interview employees, learn about procedures, and develop curricular projects. Further, teacher internships provide them with more extended worksite learning offering practical experience to incorporate in classrooms.

Results

MHS has improved academically since Oregon instituted STW reform; these gains may be linked to STW programs. Recently, SAT gains have been consistent. Although the school's socioeconomic status is low, other test scores have been increasing and are near state averages. The dropout rate has declined. Moreover, evidence of job-related learning appeared in a 1994 survey including randomly selected MHS students. It showed that most had engaged in vocational activities in the previous year, could match desired jobs to CAM strands, and could list three skills those jobs required. Finally, statistics indicate that CAM students have better attendance and discipline than the total school population and that CAM participation has significantly increased.

The school has encountered some obstacles, since teacher retirements have made it difficult to continue programs, and colleges sometimes reject graduates' work-based courses, though the courses meet the traditional entrance standards. But despite obstacles, curricular modification now extends to all grades, reinforcing state career-related learning standards. Another accomplishment has been the institution for all students of a capstone experience in a chosen career area, either in school or in community employment. Marshfield's STW restructuring has brightened the futures of its graduates and its community.

⌘

School-to-Work in a Technical High School:

A Model for Secondary-Education Reform

Roni Phipps, Metropolitan Regional Career and Technical Center, Providence, Rhode Island

Illustrating innovations inspired by the 1990s' school-to-work (STW) movement is the Metropolitan Regional Career and Technical Center (the Met) in Providence, Rhode Island, a state-funded, independent laboratory school. Designed and then operated by two Annenberg Fellows who had spent their careers as secondary educators, the Met has modeled state secondary-education reform based on what we know about student learning, including STW principles. Since opening in 1996 with one ninth-grade class, the Met has spread to two sites with all secondary grades and 100 students each. Four more urban sites are planned in the next 2 years.

Beyond a commitment to small size allowing for collegial discussion, the Met is committed to principles shared by many STW programs: that students are most motivated and learn most deeply when working on what interests them in an applied, realistic context, and that learners thrive on individual connections with adults and immersion in the world of adult standards, values, and work. This report outlines the Met's structure, internship model, and student assessment.

Structure

The Met serves a diverse, mostly urban-minority student body (22% African American and 32% Latino), about half economically disadvantaged and over a third ESL. Unlike many urban high schools, the Met has high attendance and low dropout rates. The staff includes 2 principals, 16 certified teachers (advisors), 2 counselors, a Workplace Learning Coordinator (WLC), and comprehensive support staff. Emphasizing personal involvement, its curriculum is framed by 4-year learning goals, including competencies in communication, quantitative reasoning, empirical reasoning, social reasoning, and personal qualities. Collaborating with advisors, parents, and workplace mentors, students write quarterly learning plans for achieving goals.

Met students are grouped in advisories, eight per site, two per grade level, each consisting of 12 to 14 students and their advisor. Students remain for 4 years in the same advisory, building close relationships to facilitate learning. Advisors collaborate in weekly and summer staff development, evolving pedagogy, discussing student issues, and providing mutual support. Cooperating with workplace mentors, they make site visits on student workdays to discuss student progress and update projects. Advisor involvement has proven essential for developing mentors' commitments to students.

Learning through Internship

Central to the curriculum is Learning through Internship (LTI). In ninth grade, pupils explore career interests to develop a search for a mentor in their area of interest. Eventually they conduct informational interviews and job shadows. These lead to internships allowing pursuit of interests through work that builds knowledge and skills. Students usually work 2 days weekly, supervised by mentors, who prepare them for the adult roles of worker and team member. All 9th through 11th graders are engaged in LTIs. Seniors pursue Senior Thesis Projects planned with their learning teams. Projects usually involve LTIs and mentors and result in community contributions. As students learn from each other, starting businesses and inventing products, understanding deepens.

To facilitate searches, the WLC develops relationships with businesses and organizations, recruits mentors, and identifies appropriate internships. Many students find the search challenging, and some have multiple LTIs in one year. The Met recommends that LTIs last at least 3 months; most last 4 to 9 months.

Academic instruction and LTIs are fully integrated, as advisor–mentor cooperation permits work and school learning to intersect. For instance, one student assigned to write about cat licensing for the ASPCA learned at work about effects of poor licensing on cats, and at school she researched relevant policies. While her mentor collaborated with her on statistical content, her advisor helped her develop contextual writing skills.

Student Assessment

Met students are assessed traditionally and through demonstrating skill mastery and learning-goal progress. Pupils maintain work portfolios and present LTI projects before peers, parents, advisors, and mentors. Products are assessed against workplace standards. Students hold exit interviews with their mentors to evaluate internships, and mentors complete surveys to aid student improvement. Moreover, both advisors and students write quarterly narratives evaluating progress. All students take the standardized tests required by the state as well as PSATs, SATs, and ACTs.

Conclusions

One Met graduate remarked, "I know that the values and spirit behind my school will always be with me because they're in me." That sense that school shapes individuals is what the Met instills by connecting school and work through close relationships. Met students learn more deeply than those in traditionally modeled schools about the consequences of performance and about the expectations and issues of the workplace. Schools like the Met can help students mature with a more realistic view of the world and their place in it. Such secondary institutions should be attempted more widely.

⌘

School-to-Work in Macomb County, Michigan

James Jacobs, Columbia University; and George Harrison, Macomb Intermediate School District

Integrating educational reforms with existing practices is important in school-to-work (STW) reform, which connects classrooms with workplaces to improve achievement and career preparation. This report reviews efforts to establish a STW and tech-prep (TP) system linking secondary and postsecondary education in Macomb County, Michigan. Reviewed are the context, implementation, difficulties, and successes of the system.

Context

The suburban, industrial county is dominated by the automotive industry. Serving the population of 735,000 are 21 school districts. One large community college draws many county graduates. Education here has traditionally prepared students for the automotive industry through apprenticeships and cooperative education. Vocational education has been incorporated in secondary schools. In the late 1980s, automotive-industry computerization leading to upgraded training and to job-training partnership legislation set the stage for systemic reform.

Implementation

The county's STW program, housed at the county community college, was aligned with TP there, where private-sector STW activities had long centered. The automotive industry needed postsecondary skills, so secondary postsecondary alignment became essential. Efforts were aimed at the college bound, and TP was marketed as a college transfer program. The STW grant written for federal funding established initiatives in secondary–postsecondary education, liberal arts and occupational curriculum, and classroom- and work-based learning. Governing board members overseeing the initiative established lasting school–business relationships. The program emphasized work-based learning through specific occupational training. Extensive implementation of apprenticeships and cooperative education, teacher training, and involvement of local companies in training established the work-based learning foundation.

The governing board funded only specific projects, rewarding innovation while giving school officials project management experience. The board set broad themes, but districts and community-college administrators created projects. Each proposal had to involve public educators, the private sector, and the community college, reinforcing crucial links. Moreover, to create a public role for STW reform, information on projects and outcomes had to be advertised through publications and conferences.

Since the county's industries include much of Detroit's metropolitan area and many Macomb residents work outside the county, Macomb STW developed a strong regional outreach, especially to link the suburbs with Detroit. Racial integration was a spillover benefit, aligning education with the area's integrated industries. Macomb pooled resources with other STW consortia to coordinate TP programs in four counties, allowing smooth transition to community colleges for regional high-school students. Regional marketing was also cooperative.

Barriers

Among the 1990s' competing school reforms, STW support was hard to sustain. Housing STW under different state agencies hampered efforts. Another problem stemmed from suspicion between educators and business leaders about funds management. Further, the state political climate aroused resistance to STW, since all reform was associated with a governor opposed to teachers' unions. Local problems arose when vocational educators used STW to support their declining programs instead of cooperating with systemic changes.

Secondary–postsecondary relations created significant barriers. Systemic reform conflicted with administrators' desires to control funds and curriculum. Lack of support for wider goals led to rejection of some grant proposals. Further, system-building steps like research and regionalizing were resisted, since they only indirectly helped students and involved collaboration, which neither side trusted. Other barriers were lack of interest in postsecondary curriculum integration and fears that innovation would upset collective bargaining contracts.

Research and Measures of Success

To measure success, 5-year high-school follow-up surveys and economic and occupational forecasts were implemented. The surveys helped foster local support and sharing of high-school remediation and performance data with colleges. The forecasts helped educators relate skill-building efforts to real trends. Further information on successful implementation and integration was compiled. Highlights included increased attendance, graduation rates, standardized-test scores, college enrollment, educator training, and work-based-learning involvement. School–college partnerships and countywide information sharing also increased. Districts instituted career guidance and career fairs. Career awareness and development were included in accreditation and school improvement plans, and the county won state awards for innovation.

These results indicate the extent of Macomb's STW implementation. Once reforms are fully integrated, further research on student outcomes will be more meaningful. Efforts have been most successful in integrating secondary with postsecondary career and academic instruction. Transformed into the new Michigan Career Preparation System, STW and TP in the county continue fostering secondary–postsecondary alliances and career counseling. As national STW funding ends, leadership passes to other hands that can carry the integrative process further. That may be the truest measure of success for the county's STW reforms.

⌘

(**New Economy**, continued from p. 2)

value may be more costly to generate than the gain in value for consumers can support, as the losses of Amazon.com illustrate. Even the rapid expansion of world markets has limited value, since computers have made for larger and more efficient marketing efforts but not for new products.

Implications for the Educational System

As have earlier technological shifts, the computer-technology-driven economy has changed the U.S. labor market by creating demands for new skills and talents that cannot be immediately met by the workforce. The educational system traditionally responds slowly to such demands, but it does meet them. A more crucial problem presently is the large group of workers who have not mastered basic reading, writing, and math skills. Workers with the basic skills can be trained for more focused, specialized jobs in the marketplace. In the meantime, the rising wages of workers with the new skills will induce changes in the educational system in response to these new skill needs.

Moreover, demographic changes are contributing to an unprecedented shortage of college-educated workers, as college graduates are now leaving the labor force as quickly as they enter, leading educators and policymakers to perceive a need for more college graduates. At the same time, blue- and pink-collar jobs in manufacturing and service sectors are requiring fewer skills for entry, because computerization has increased the reliability and performance of many processes. Thus, low-skilled workers who might otherwise depend on welfare have the opportunity to gain basic work and social skills that their schools may not have provided.

Another worrisome development for the educational system to address may be the deficit in basic financial expertise. Since stock investments are now almost as large as housing in American families' portfolios, and since strong savings and financial sophistication must support future economic growth and investment, the future will require financially sophisticated workers and consumers. Here schools face a challenge, since a recent series of studies by the American Financial Services Associate Education Foundation has shown that the financial knowledge of high-school students has declined between 1997 and 2000. Of all seniors tested, 59% failed, scoring below 60%. Introduction of entrepreneurial principles in schools may help improve students' financial knowledge.

However new our economy may be, educators and all Americans must worry about how children are going to gain the knowledge and skills, the human capital, needed to manage wisely the financial capital their parents have earned.

⌘

(**Youth Labor**, continued from p. 3)

grew from 3.0 to 4.1%, though both groups ended the decade with lower unemployment than in 1990. Wages for both races also followed the decade's fall and rise, with the decline and recovery somewhat steeper for Blacks. The differences in hourly pay rose slightly—less than $0.25 per hour—over the decade.

Overall figures mask larger differences between racial subgroups of gender and education. For male Black youth, unemployment rose more quickly and declined less steadily than for White men. Since female White youth showed a rise in unemployment at the decade's end, Black females showed a greater convergence with White females than did the male subgroups. Racial wage gaps did not change appreciably for men, but Black women drew equal with White women after a decline in pay earlier in the decade.

Education also made for different impacts by race, as the wages of White and Black dropouts were similar, but Black youth without diplomas were far more likely to lack jobs. Black dropout unemployment peaked in 1994 at more than double the White rate. While the rate declined by 1999, 27% of Black dropouts remained jobless. Still, over the decade, Black unemployment fell 5.5% while White joblessness fell only 1%. A similar unemployment pattern appeared for young Black high-school graduates. Though these graduates saw less unemployment, they did not show the same gains over the decade as Black dropouts.

Wage differentials, meanwhile, grew to about 11% between White and Black high-school graduates, as wages for Whites grew while those for Blacks remained flat. Young Black college graduates made the greatest gains in the decade, with unemployment differentials between the races falling from 7.5% to 2.5%. Since wages of Blacks with college degrees rose by 58% and their White counterparts' 23%, at the decade's end, the real wages of Blacks were 19.5% higher than Whites'.

A worrisome trend tempered this encouraging change, however, as all young workers, especially Blacks, shifted to lower educational levels over the decade. Although a statistical adjustment by the CPS played a role in this change, the percentage of Blacks with college degrees rose only slightly, while the percentage of dropouts rose strikingly. Since dropouts show greater unemployment and lower wages, this shift explains why Blacks as a whole did not benefit significantly during the 1990s. Finally, while racial differentials give little support to the common explanations for economic variations, they do show that good economic times decrease economic inequality between races, and the converse is also true.

Gender and the Youth Labor Market

In the 1970s and 1980s, the wage gap between young males and females gradually closed, as women enjoyed pay growth in the service sector and male wages were eroded by the

(**Youth Labor**, continued on p. 35)

Next-Step Recommendations

The participants forged recommendations for action at three levels of governance: local, state, and federal. They also offered general recommendations.

Local Recommendations

- Promote STW leadership at the district and school levels.
- Continue and develop existing career-awareness programs.
- Implement new career-development continuum/curriculum at the district and school levels.
- Improve inservice training for high-school counselors about STW programs and vocational choice in today's economy.
- Include STW in the professional development programs of both districts and schools.
- Institute financial support for stipends, summer internships, and substitute pay.
- Include STW in other efforts towards educational reform, such as Comprehensive School Reform Demonstration programs.
- Find employer champions, and increase employer involvement.
- Network with business communities.
- Develop leveraged relationships with business partners.
- Support teacher–business exchanges and internships.
- Share community resources for STW, including volunteer mentors and parents.
- Integrate STW partnerships with other groups, such as Workforce Investment Act coalitions, or at least foster communication between them.
- Foster partnerships with postsecondary institutions, especially articulations between high schools and community colleges.
- Evaluate schools on the success of graduates in the workplace and postsecondary institutions.

State Recommendations

- Provide STW leadership in the state, and establish ongoing STW funding.
- Link STW with other educational, labor, and economic efforts in the state.
- Review and realign state education regulations to include career education through work-based learning experiences.
- Incorporate aspects of STW certification requirements for certification of teachers and other educators.
- Include STW outcomes in state education standards through establishing interdisciplinary, contextual, and structured work-based learning.
- Support educational standards by establishing STW models for teaching to standards and for professional development.
- Encourage sharing of best practices and lessons learned with other states.
- Follow up on STW programs with longitudinal studies of education and workplace outcomes (including degrees, income, and defined career path) of state high-school graduates after five or more years, and publish the results.

Federal Recommendations

- Define leadership clearly to give the movement identity and to articulate a clear vision and framework for implementation.
- Work with other key industries as a major employer to develop, evaluate, and revise usable skill standards, beginning with pilot-industry standards to guide further STW development after STWOA sunset.
- Connect national standards to internships and academic credit, with possible links to community colleges' tech-prep programs.
- Support best practices by funding research that helps students reach state standards, encouraging conferences and other means of discussion, and documenting and distributing data on best practices like career academies.
- Broaden Workforce Investment Act student-eligibility guidelines to permit greater STW participation.
- Establish a national data clearinghouse to gather data about successful STW models.
- Operate a strong research and evaluation component, with focuses on program improvement and redesign of skill standards.
- Collect and quickly distribute STW research reports in the National STW Office.

General Recommendations

- Develop funding sources creatively through marketing and resource mapping.
- Convince businesses and community leaders that STW values and goals accord with theirs.
- Link schools and workplaces more closely by fostering more intensive, industry-driven initiatives tied to broader economic development.
- Promote STW to companies as potential sources of free labor, good publicity, and efficient recruiting.
- Promote STW to students and parents as providing a variety of postsecondary education and work options to choose from.
- Include STW training in all preservice teacher-education curricula.
- Encourage nontraditional learning methods in STW programs to support lifelong learning.
- Implement comprehensive rather than piecemeal plans at all levels.

⌘

(**Youth Labor**, continued from p. 33)

decline of union-supported manufacturing jobs. Unlike in earlier decades, young women did not see significant relative pay gains in the 1990s. Their real wages stayed at 8 to 12% below men's. This pattern remained when the genders were analyzed by race. Young White women lagged behind White men in wages throughout the decade, and Black women's wages fell below men's in all but two years.

Pay differentials analyzed by educational level showed similar patterns: Women were paid less at all levels, with little convergence or divergence, except in 1999, when the genders' wages for college graduates and high-school dropouts converged, perhaps anomalously. The wage gap was smaller for college graduates and less stable for dropouts.

Paradoxically, young women experienced lower unemployment for most of the decade, despite low wages, their joblessness equaling that of men only in 1999. This difference and the decade-end convergence were similar between genders for both Whites and Blacks, though the pattern was less steady for Blacks.

Conclusion

This analysis demonstrates that the youth labor market in the 1990s showed neither the major convergences nor the divergences expected on the basis of the key explanations for shifts in equality during the two preceding decades. Further study is needed to determine the significance of and contributing factors to such economic differentials, both in the youth labor market and in the wider economy.

⌘

(**Minority Youth**, continued from p. 17)

participation of minority youth exceeds that of Whites. But although Black students have the highest STW participation rate, Hispanics have the lowest. The influence of immigrant status on Hispanic participation merits further study. STW programs motivate greater math and science study for minority youth and decrease dropout rates for all students. Although they also stimulate greater labor-market participation, no evidence was found that, among STW participants, there is a conflict between school retention and increased hours worked. STW participants worked longer hours, but they were also more motivated to stay in school.

In the past, vocational education programs were criticized for tracking minority youth out of college-bound careers and moving them instead towards relatively unskilled, low-wage occupations. Analysis of the NLSY97 has found, however, that STW programs are not subject to these criticisms.

⌘

Acknowledgments

We thank the following Plenary Session Chairs and Discussants for their contributions to the conference.

Thomas Bailey
Institute on Education and the Economy
Teachers College,
Columbia University
New York, NY

Sharon Belli
National School-to-Work Office
Washington, DC

Pamela Finney
SouthEastern Regional
Vision for Education
Greensboro, NC

Bryna Shore Fraser
Academy for Educational
Development
Washington, DC

Joshua Haimson
School-to-Work Department
Mathematica Policy Research, Inc.
Princeton, NJ

Robinson Hollister
Economics Department
Swarthmore College
Swarthmore, PA

Janice Madden
Sociology Department
University of Pennsylvania
Philadelphia, PA

Susan Poglinco
Consortium for Policy Research in
Education
University of Pennsylvania
Philadelphia, PA

James R. Stone III
Department of Work, Community, &
Family Education
University of Minnesota
Saint Paul, MN

⌘

The CEIC
REVIEW

Mark Rohland
Editor

This publication is supported in part by the Laboratory for Student Success at the Temple University Center for Research in Human Development and Education (CRHDE). The opinions expressed do not necessarily reflect the position of the supporting agencies, and no official endorsement should be inferred.

For more information, write CEIC, Temple University Center for Research in Human Development and Education, 1301 Cecil B. Moore Avenue, Philadelphia, PA 19122-6091, or call (215) 204-3000. Selected CEIC publications and abstracts of articles, including back issues of the CEIC *Review*, are available at http://www.temple.edu/LSS/ceicrevlist.htm

Temple University Center for Research
in Human Development and Education
1301 Cecil B. Moore Avenue
Philadelphia, PA 19122-6091

Non-Profit
U.S. Postage Paid
Philadelphia, PA
Permit No. 1044

The National Center on
Education in the Inner Cities

The CEIC
REVIEW

A catalyst for merging research, policy, and practice.

Volume 10 • Number 9 • October 2001

Taking Small Classes One Step Further

Reports and Recommendations from a National Invitational Conference

Jeremy D. Finn, State University of New York at Buffalo; and Margaret C. Wang, Distinguished Professor and Director, Temple University Center for Research in Human Development and Education

Reduced class sizes in American schools are becoming a reality. Through federal, state, and local initiatives, schools have been hiring more teachers and implementing smaller classes in the elementary grades as a strategy for improving learning, especially in schools serving students at risk for failure. This initiative for class size reduction (CSR) has resulted in a substantial cohort of teachers and administrators with significant experience and expertise working in small classes.

The current CSR movement has arisen from public concern about the quality of education and from research that confirms that children learn better when they are placed in small classes with effective teachers. The results of CSR experiments like Tennessee's Project STAR, Wisconsin's Project SAGE, and California's statewide program for reducing class size in Grades K–3 all indicate that—both in the short and long run—placement in small classes at an early age has academic benefits that are especially profound for children at risk.

Nevertheless, CSR as a school-reform strategy has raised other pressing questions about classroom process. How can we apply existing research and instructional models to make small classes optimally effective? What instructional strategies work best in small classes? What professional development experiences do teachers of small classes need?

Equally important questions have been raised about how best to implement CSR in schools. Given limited school resources and space, how do we utilize existing funds and facilities to implement small classes? How can CSR be combined with other early-intervention programs like preschool or remedial reading to enhance the benefits of small classes? How can we establish communication and dissemination networks to inform the public about the benefits of CSR? How should districts and states evaluate CSR initiatives for optimal program development?

In seeking answers to such questions, researchers, administrators, and teachers have recognized that small classes will not solve all our schools' problems or completely close the achievement gap among student groups. However, CSR can be a facilitating condition for teaching and learning. Educators also realize that the shortage of experienced teachers to staff new classes, the paucity of information about best practices in small classes, and the need for effective procedures for evaluating small-class initiatives all call for a more extensive understanding of the use of CSR in school reform.

It was in this context of extending what we know about small classes in order to facilitate classroom practices effectively that this national invitational conference on furthering our understanding of CSR was held. Its purposes were both to facilitate effective implementation of CSR and to promote research on those instructional practices that are most effective in small classes. It built on the

The National Center on Education in the Inner Cities is a unit in the Temple University Center for Research in Human Development and Education, an interdisciplinary center devoted to fostering healthy developmental and educational success of children and families in this nation's urban communities. Inquiries about the work of the Center should be sent to Information Services, CRHDE, Temple University, 1301 Cecil B. Moore Avenue, Philadelphia, PA 19122-6091. Copyright © 2001

knowledge base shared and developed in a related conference held in December 1999, "How Small Classes Help Teachers Do Their Best."

Both conferences, cosponsored by the U.S. Department of Education and the Mid-Atlantic Regional Educational Laboratory for Student Success (LSS) at the Temple University Center for Research in Human Development and Education (CRHDE), provided forums for national dialogue on how to advance current practices to achieve school success for the increasingly diverse student population in the nation's schools. This conference, convened in Washington, DC on November 30 and December 1, 2000, was particularly timely, given that the improvement of American schools has become a national priority, that resources for CSR are being allocated more widely, and that we have yet to determine how to optimize the use of those resources to improve schools.

At the conference, leading educators, policymakers, and researchers in the nation gathered to discuss ways that schools, states, and the federal government can further the CSR reform effort through research and practical application and to extend the progress made at the 1999 conference. To those ends, the organizers of the conference commissioned papers from leading scholars and educators that examined three broad themes: teaching practices in small classes; evaluation of small classes; and support of effective classroom structures and teacher development. In addition to in-depth discussions of the implications of findings reported in the commissioned papers, the conference featured a panel in which practitioners shared their experiences and lessons learned from implementing CSR. They focused on issues of incentives, instruction, and professional development that arise from that implementation. Conference participants also worked intensively in small groups to discuss the key themes and to generate next-step recommendations for advancing reform efforts.

This issue of the CEIC *Review* provides a synopsis of those recommendations and summaries of the commissioned papers. In doing so, the issue contributes to a goal that conference participants identified as crucial to the success of CSR as a school-reform strategy: dissemination of research and practical knowledge in an understandable form that can facilitate the policy and classroom efforts that lead to student success.

Advancing School Reform Through Class Size Reduction: Next-Step Recommendations

While conference participants expressed divergent opinions on specific next-step strategies, substantial consensus emerged through small work groups. The groups' recommendations focused on four major topical areas: improving organizational and implementation support for CSR; professional development focusing on effective practice in the classroom; strategies for broader dissemination of the knowledge base; and evaluation strategies that will inform future CSR efforts.

ORGANIZATION AND IMPLEMENTATION SUPPORT

In order to use what is known from research on CSR to develop and support effective school reform based on smaller class sizes, and to overcome some of the practical obstacles to implementing CSR, work groups discussed what steps would optimize support within and beyond schools implementing the reform. Several points of agreement emerged:

- Government support for program initiation and continuation should take into account the need for funding and implementation strategies that have been proven to work.
- Knowledge about optimal classroom structures and best practices should be actively incorporated in the organization of new and existing programs.
- Ongoing, mutually beneficial collaboration among CSR schools should be fostered to develop initiatives effectively.
- Administrators should encourage instructional leaders to advocate and support CSR initiatives in their schools and districts.

PROFESSIONAL DEVELOPMENT

The development of teacher expertise and classroom practices in order to maximize the potential benefits of small classes played an important role in work-group discussions. Major recommendations included the following:

- Ensure that as funds are allocated to CSR, they are also adequately earmarked for staff development.
- Relate professional development closely to successful CSR models.
- Plan professional-development activities so that the needs of both beginning and experienced teachers are considered.
- Focus professional-development workshops on classroom-management issues, including time on task, discipline, and record keeping.
- Concentrate professional development efforts on the use of those practices that are best suited to

small classes, such as balancing the breadth and depth of content coverage and building on the increased sense of community among teachers and pupils in small classes.

DISSEMINATION OF THE KNOWLEDGE BASE

A broader dissemination of the knowledge base on small classes was considered as an essential next-step task in advancing implementation of CSR policy at state and local levels. It was concluded that to garner continued and expanded support for CSR policy, the public needs to be educated about the nature of programs to reduce class size, the support needed to achieve successful implementation, and the improvements in teaching and learning that the programs produce. Policymakers, educators, and administrators should expand collaborative relationships to keep all concerned updated about the latest research, recommendations, best practices, and successful CSR programs.

Participants proposed specific strategies for expanding delivery of information regarding CSR research and practice for school reform, including the following:

- Disseminate audience-specific information, through both traditional and Internet-based media, about the benefits of CSR, targeting information to policymakers, administrators, principals, teachers, and parents.
- Collaborate more effectively with national organizations like the Council of Chief State School Officers and the American Association of School Administrators to compile and disseminate findings on CSR initiatives.
- Create publications that increase general awareness of
    - research on the academic and nonacademic benefits of small classes;
    - feasible funding mechanisms for CSR;
    - regulations accompanying state and federal CSR funding and their interpretations in different locales;
    - ways to deal with the need for additional teachers and classrooms when both are in short supply,
    - the most efficient ways to implement CSR in particular schools and districts;
    - optimal instructional strategies for small classes;
    - ways to share experiences with other teachers and administrators who have experience with CSR initiatives; and
    - methods for evaluating CSR initiatives in both the short run and the long run.
- Develop strategies for sustaining continuous collaboration and networking among CSR teachers, including traditional person-to-person opportunities like workshops and conferences and virtual opportunities, such as videos, videoconferencing, and the Internet.

EFFECTIVE EVALUATION

Conference participants called for further evaluations to inform and improve CSR practice. Evaluations of both small- and large-scale CSR efforts are needed to show why small classes work and to determine the conditions under which they work best. The following steps were identified for making evaluation more effective:

- Encourage efforts to increase funding for CSR data collection and assessment at the state level.
- Support long-term evaluations to extend the scope of available data.
- Conduct implementation studies before undertaking large-scale research projects to determine appropriate research questions and important variables for improving the accuracy of evaluation.
- Use multiple evaluation indices to better understand the total effect of CSR, including
    - teacher satisfaction and retention rates;
    - student achievement and attendance patterns;
    - student social and emotional development;
    - quality of classroom environment; and
    - parental involvement and feedback.
- Evaluate how support from the community at both the school and district levels translates into the success of a CSR initiative.
- Design studies to estimate the effectiveness of CSR for English language learners and students with disabilities.

Conclusion

In both general discussion sessions and small work groups, participants concluded that increased sharing of knowledge is vital to the progress of CSR reform. Especially important is communication of knowledge between practitioners and researchers and among practitioners working in different small-class environments. Improving communication is important for fostering the sense of community that is a chief benefit of small classes. Communication of results showing effective CSR efforts to policymakers is also crucial to the success of the reform. ⌘

Life at Draper Elementary School:

Class-Size Evaluation Lessons

Patrick Harman, SERVE

Since 1996, *SERVE* has been evaluating the comprehensive school reform (CSR) initiative at Draper Elementary School, located in a rural mill town in central North Carolina. Their most recent findings indicate that class size reduction has led to more effective teaching and improved academic performance at the school. In the past four years, *SERVE* evaluators have gained a number of important lessons on conducting evaluation research relative to understanding the school context, observing the school and classroom processes, and evaluating perceptions from the multiple perspectives of teachers, parents, and staff.

Lesson 1: Understanding the School Context

SERVE has provided Draper Elementary with an annual evaluation of the initiative as it relates to student achievement and implementation, which entails frequent visits to the school to assess students, observe classrooms, and talk with the teachers and principal. *SERVE* has also provided professional development support to the faculty as it relates to reading-instructional strategies and use of student portfolios.

In 1995–1996, prior to the CSR initiative, Draper ranked 13th among the 14 district elementary schools in the grade 3–5 achievement rankings, and only 61% of the students were on grade level. After the first year of implementation, *SERVE* staff reported to the faculty that a majority of their kindergarten students were 6 months to a year behind in development when they entered Draper. Thus, an additional reading program was established for all students, and an after-school tutoring program was initiated. A one-to-one in-school mathematics support program was also created.

Lesson 2: Understanding School and Classroom Processes Through Observations

Much can be learned by observing programs in action. Observations reveal differences between how a program is running and how it is intended to run. *SERVE* evaluators observed classrooms in May 2000 to begin determining the typical instructional strategies employed in small class-size classrooms. Arriving unannounced, one of three observers spent 15 minutes in each classroom recording what was taking place in terms of grouping, instructional and orientation practices, student activities, technology use, and assessment techniques.

The most frequently observed instructional strategies were instructional feedback to enhance student learning (15 classrooms), direct instruction with the entire class (14 classrooms), and independent seatwork (12 classrooms).

In 2000, *SERVE* began to examine what happens to a school when it implements class size reduction. In particular, investigators wanted to understand the types of interactions that occur in small class-size schools between students and teachers and between students as well as the purposes of the interactions observed. Over the course of a week in the fall of 2000, four *SERVE* observers spent at least two hours each at Draper observing in the hallways, the cafeteria, classrooms, and the media center. Each interaction was coded as instruction-oriented (receiving/providing assistance, guidance, or information), relationship-oriented (conversation and praise), and management-oriented (discipline and order). On the basis of this data, the evaluators developed vignettes describing what was observed in various venues in the school.

Lesson 3: Understanding Perceptions from Multiple Perspectives

Focus groups revealed that parents and teachers often report observing similar phenomena. For example, the teacher focus group conducted at the end of the 1996–1997 school year highlighted several implementation difficulties as well as many perceived benefits of smaller classes. Reflecting back on the year, both parents and teachers were concerned about the loss of assistants and specialty teachers necessitated by the class-size reduction initiative. On the positive side, teachers and parents noted the positive atmosphere in the class, increased communication between parents and teachers, greater variety of instruction taking place in classes, and significant improvement in the students' reading skills.

It is critical that evaluators and researchers continue to examine implementation issues and the potential benefits of smaller classes. Studies such as those at Draper are important in building the procedural knowledge about how smaller classes work that will aid other schools in their efforts to implement CSR initiatives. Over the next few years, *SERVE* will be conducting a series of meetings for district teams interesting in implementing CSR. Meetings will focus on CSR implementation, including classroom space, financial resources, and personnel. *SERVE* is also establishing a cadre of CSR-experienced teachers and administrators to allow opportunities for educator teams to attend instructional-strategies workshops in the summer. ⌘

Design for the Evaluation of the Federal Class-Size Reduction Program

Mary Ann Millsap and Beth Gamse, Abt Associates Inc.

In spring 2001, Abt Associates Inc. began a national evaluation of the class-size reduction (CSR) program for the U.S. Department of Education. The study was to focus on implementation and early impact of a *federal* program, not on class-size reduction efforts in general.

Data collection was to include surveys of representative samples of districts and schools as well as site visits to six states, two large districts in each state, and two schools in each district. The states selected differed by such variables as federal CSR allocation, existence of state class-size reduction efforts, and geographic region.

The evaluation was designed to investigate four major areas: (a) distribution and uses of federal CSR funds; (b) implementation of the federal program; (c) impact on class size; and (d) impact on teaching.

Distribution and Uses of Funds

Class-size reduction funds are intended to serve multiple purposes. The largest proportion of funds goes to support teacher salaries; smaller proportions are intended to support teacher recruitment and professional development. The evaluators were particularly interested in documenting the numbers of teachers hired and the extent to which districts drew upon multiple funding sources for hiring. Other topics of interest included the use of CSR funds in district decisions about whether and how to participate in CSR, the distribution of CSR funds to schools, and the nature of professional development supported with CSR funds.

Program Implementation

This evaluation was to focus primarily on how districts and schools have implemented the federal CSR program at four levels: state, district, school, and classroom/teacher. Research questions at the state level were to explore interaction with other state initiatives, especially for class size reduction. Questions about the state role were to be addressed through the site visits, capitalizing on the diversity across states.

Questions about district-level implementation were to consider sources and qualifications of new teachers, types of recruitment activities, types of staff development and training provided for uncertified teachers, ways districts cope with shortfalls between CSR allocations and actual costs to staff smaller classes, and effects of the CSR program on availability and maintenance of facilities.

Data were to be collected on various school-level implementation issues, including the number of teachers each school hired, the modifications, if any, schools had to make to add teachers, and perceived effects of CSR on the school. Also of interest, as an influence on implementation, were the level of principals' discretion over categorical funding and comparison of their spending priorities for their schools' budgets to districts' priorities.

Among classroom-level topics to be addressed were any instructional modifications used to capitalize on the increased flexibility thought to accompany reduced class size, teachers' interactions with students and with one another on instructional issues, and the proportion of time focused on classroom management rather than instruction.

Impact in the Classroom

The evaluators wanted to investigate whether federal CSR funds were indeed used to reduce class size and, if so, by how much. Information for the past three school years was to be collected, allowing evaluators to compute the average number of students per classroom, per teacher, and per full complement of teachers at each time point for each grade. Thus, the study would show how adding teachers affected the average class size in a grade.

Since the federal program aims to improve teaching, the evaluation was to examine changes in instructional practices through classroom observations and self-reports of observed teachers. Evaluators were to ask teachers to compare their reduced classes to larger classes in earlier years. Also to be explored was the extent to which teachers have been able to enrich curriculum or promote elaborated homework assignments. District and school efforts to support teacher learning would be documented.

The completed study will provide nationally representative findings on how federal CSR funds were spent and how many teachers were hired with the funds. It will furnish comparative results on the educational backgrounds and experiences of teachers in reduced-size and nonreduced classrooms. The study will also offer federal-level data on issues faced by state class-size reduction efforts, such as teacher shortages in large, high-poverty districts. Finally, it will furnish rich qualitative data on district funding decisions, selection and outfitting of schools for CSR, and changes in teaching practice to take advantage of smaller classes. Once disseminated, these findings will be useful to federal policymakers as they deliberate the redesign and refunding of the CSR program. ⌘

Evaluating the Effects of Statewide Class-Size Reduction Initiatives:

The Need for a Systemic Approach

George W. Bohrnstedt, American Institutes for Research; Brian M. Stecher, RAND; and Michael Kirst, Stanford University

One of the most popular programs that the federal government and a number of states have undertaken to improve student achievement is class size reduction (CSR). Because CSR is among the most expensive of the various educational programs, it is important that states with CSR initiatives evaluate whether the program is having its intended effects. Although most efforts to reduce class size have occurred at the local or district level, a systemic approach to the evaluation of CSR is in order regardless of the size and level of the intervention.

The Conceptual Model

In order to ensure a comprehensive, systemic research design for evaluating the effects of CSR in California, the consortium of organizations contracted to evaluate CSR designed a conceptual model to capture the complexity of the system within which CSR was occurring. This conceptual framework is probably general enough to be used as a starting place for other states implementing CSR at multiple grade levels on a statewide basis as was done in California. The model examines how district and school policies might have been affected by the state's CSR initiative and how these policies relate to resource allocation, other ongoing reforms, parental involvement and support for the program, and teacher quality and training.

Some General Principles Used in Formulating the Study Design

Consortium researchers first spoke with major stakeholders, including state-level policymakers, superintendents, teachers, researchers from the consortium's organizations and other organizations, and independent consultants. From these discussions, a number of principles emerged for the evaluation of CSR in California that would seem appropriate for an evaluation of CSR in any state:

- A single, integrated evaluation is preferable to a set of unrelated small-scale studies.
- The study design needs to be comprehensive because CSR is a system-wide intervention.
- The evaluation should be both formative and summative.
- A longitudinal design is essential.
- The evaluation needs to be as rigorous and objective as possible so that the findings will be credible to both supporters and skeptics.

The Sampling Design

In order to link and aggregate the information gathered at different levels of the system, a nested sample of 125 representative districts and 625 schools was obtained. This was followed by a selection of one first-grade teacher from one half of the sample schools and one second-grade teacher from the other half. In addition, from each of the sampled schools, one, two, or three third-grade teachers were selected, depending on the number of third-grade teachers in the school. Finally, a random sample of parents of third-grade students whose teachers had been selected for the teacher sample was drawn.

The survey provided extremely useful data on the problems districts and schools had in implementing CSR and on why some chose not to implement CSR at all grade levels or at all in the initiative's first three years. It also provided data on the ways in which the implementation of CSR either articulated with or interfered with other ongoing education reforms in the district. The surveys were used to document how CSR exacerbated the preexisting space crunch in schools. The surveys of teachers provided invaluable data on whether and how their classroom practices changed as a function of being in a reduced classroom. The survey data from parents made it possible to determine the degree to which parental involvement with the teacher changed as a function of whether the child was in a reduced classroom and to determine parents' general perceptions of the quality of their children's education as a result.

Assessing Achievement Effects

Assessing the achievement effects of CSR in California was complex. First, there was no baseline data, since the CSR was introduced in the fall prior to the adoption of the new state assessment (SAT-9). Second, even if there had been baseline data, California's state data system does not allow linking student data over time. Third, not all students were exposed to CSR at the same time; district discretion on the implementation led to differences statewide in participation by grade level, by school, and by year. Ninety-nine percent of first-grade students and 95% of second-grade students participated in CSR in 1997–1998, as opposed to only about 70% of third-grade students. The combination of natural variation in CSR participation and the availability of achievement data that is necessary for conducting the evaluation made third grade the most appropriate focus for the evaluation study. The schools that reduced class size in the third grade were different in terms of their demographic composition from those schools that did not reduce their class sizes—an important factor to be taken into account when making comparisons.

These analyses were repeated in both the first two years of the CSR evaluation study in California. Over the next two years, the consortium will be investigating the cumulative impact of CSR with a longitudinal "dose-response" analysis that compares test scores of consecutive cohorts of fourth graders. CSR does not apply to the fourth grade, and for that reason, systematic changes in fourth-grade performance can serve as an outcome index with which to measure CSR's effect on learning.

THREATS TO VALIDITY IN EVALUATING CSR

The use of nonexperimental designs like those used in California is fraught with threats to validity. For example, California introduced a new state test the spring after CSR was initiated. Since teachers often begin to teach to the test, the gains observed on the new test do not generalize to measures of the same content area when assessed by a different test.

In California, roughly a third of the students in the first three grades are classified as English Language Learners. Researchers were concerned that the SAT-9 might not be sensitive enough to pick up reading gains for this group of students, but they did not have sufficient funds to add a reading readiness test to determine whether prereading achievement gains were occurring for these groups of students.

Numerous reforms have been introduced in California since the introduction of CSR, thereby making it difficult to draw firm conclusions about whether gains in achievement are due to CSR or to other programs. A more rational and thoughtful approach to the introduction of CSR in California—one in which evaluators worked with policymakers in the design and implementation of program—might well have resulted in greater ease in inferring program effects.

A Three-Step Approach Employing an Experimental Design

The preferred approach for determining the effects of a new reform initiative such as CSR would include three steps:

Step 1: The Implementation Issues Study

The purpose of the implementation issues study is to determine whether there are barriers that would prevent the successful implementation of CSR. A sample of districts would be surveyed to gain information about the difficulty or ease districts of various types would have in implementing CSR. The state would then use these data along with its own data on teacher supply and demand to decide the feasibility of implementing CSR at all levels in the initial program.

Step 2: An Experimental Field Trial

Once implementation issues are resolved, a field trial would be conducted to determine the effects of CSR at whatever grade levels the intervention is planned for and whether it is helping to close the achievement gap. The trial should run for a minimum of two years to assess change.

The experiment would be more powerful if one could randomly assign teachers to classrooms as was done in Tennessee, thereby determining the degree to which teachers' years of experience and degree level might interact with class size, the percentage of at-risk children in the classroom, and the influence of other variables in their effects on student achievement. There are many alternative experimental conditions that could be considered, but the inclusion of each condition needs to be weighed against the practical and political difficulties one would face in trying to introduce them.

The main outcome to be monitored would be gains in student achievement. Were the gains the same for all students, or did certain classes of students show greater or lesser gains than others? It is also important to monitor whether the intervention was implemented as planned. Were there systematic differences in the credentials of teachers in the experimental versus the control classrooms and were there differences in the way teachers in the smaller classrooms taught compared to those in the larger classrooms?

Step 3: Statewide Implementation

The state would then examine the results from the implementation issues study and the field trial and make a decision about whether to implement the program as designed or to make changes to it. Changes could include a decision to move a disproportionate amount of the resources to districts with high proportions of high-risk children or to provide incentives to move fully credentialed teachers to schools with high proportions of at-risk students.

This study suggests that it would be wise to conduct small-scale studies before introducing CSR statewide. An implementation issues study combined with a field trial can be invaluable for states in developing cost-effective, targeted class-size reduction programs. Such programs may help to reduce or eliminate the unintended consequences observed in California when it implemented its class-size reduction program. ⌘

Balancing Breadth and Depth of Content Coverage:

Taking Advantage of the Opportunities Provided by Smaller Classes

Lorin W. Anderson, University of South Carolina

An increasing amount of evidence suggests that students in smaller classes in the early school years, on average, continue to outperform their peers in larger classes on standardized achievement tests after they return to same-size classes in later school years. However, there is wide variation in the mean achievement scores of students in smaller classes; some conditions in smaller classes will result in greater student achievement, while other conditions will not. The challenge for researchers is to try to understand the conditions under which reduced class size produces achievement gains.

Smaller classes provide opportunities for teachers to engage in practices that improve student achievement; however, it is what teachers do in and with smaller classes that makes the difference, not simply the presence of smaller classes. Smaller classes allow teachers to achieve a greater balance between breadth and depth of content coverage and enable teachers to teach better, but not necessarily differently.

Breadth Versus Depth of Content Coverage

Content coverage is typically defined in terms of (a) the number of textbook pages students have completed; (b) the number of curriculum topics that teachers have taught; or (c) the proportion of items on an end-of-year achievement test for which students have had an opportunity to learn the relevant content. Content coverage is synonymous with breadth of content coverage.

The difference between breadth and depth of content coverage is shown in the conceptual distinction between the specific experiences we have in life ("instances") and the formation of "instances" into categories of experience. The process of forming categories, known as conceptualization, is a critically important part of the process of understanding. Part of good teaching involves helping students form categories that represent the way others see the world. Whereas the number of instances equates with breadth of content coverage, the number of categories as well as their complexity, their abstractness, and the relationships among them combine to produce the depth of content coverage.

Content Coverage and Student Learning

The distinction between breadth and depth of content coverage is important because it results in very different types of learning. Breadth of content coverage is more likely to result in greater retention of what is being learned, but not necessarily greater understanding. In contrast, depth of convent coverage is more likely to result in greater transfer of what is being learned, in part because it leads to greater understanding. Because both retention and transfer are important educational goals, a proper balance between depth and breadth of content coverage is highly desirable.

Given these two distinct goals, one might ask "Why not have the teacher focus on breadth of content coverage and let the students be responsible for depth of content coverage?" Quite clearly, this approach works well for some students, but for large (and increasing) numbers of students, teachers need to do more.

Moving from the "How" of Teaching to the "What" of Learning

Because most principals are responsible for teacher evaluation and because most teacher evaluation instruments are teacher-centered, most principals have been taught to focus on the teacher during their classroom observations. In one recent study, this researcher worked with 11 principals in a single school district to help the principals shift their focus from the teachers to the students. A series of monthly seminars was conducted for the group, followed by individual work with each principal. During the school visit, the researcher and principal observed a minimum of two classes using a semistructured observation form. One such occasion provides a good example of the distinction between breadth and depth of content coverage.

A mathematics lesson was given to a third-grade class of 18 students in which the objective was for students to understand tenths, hundredths, and thousandths. Understanding was indicated if students could translate a given number into words, or vice versa. About halfway through the lesson, it became apparent that about two thirds of the students were having great difficulty.

Following the observation, the principal and researcher discussed the classroom experience. The principal had noticed a pattern to the students' wrong answers: For example, the teacher asked Emily, "How do you write five tenths?"

BEST COPY AVAILABLE

and Emily wrote .05 on the board. She later asked another student how he would say .038 (written on the board) in words and he said thirty-eight hundredths. Similar mistakes were made by other students.

The researcher recognized that there is a lack of symmetry in the whole number–decimal number line: There is no "oneths." That is, the tens place is two to the left of the decimal point, but the tenths place is only one to the right of the decimal point. If the students do not realize this, they may be reading everything to the right of decimal point according to the "rules" governing the places to the left of the decimal point. The principal and researcher suggested that the teacher start over and help students understand the asymmetric nature of this number line. The teacher revamped the lesson, and soon the students were able to answer the questions without a problem.

What can we learn from this example? If we focus on the teacher—the "how" of teaching—we see a very common approach to teaching. The teacher taught the children in a whole-class format. It is this "commonness" of teaching that has led to the conclusion that teachers do not teach differently in smaller classes than they do in larger ones.

If the focus is on students, however, attention is shifted from the "how" of teaching to the "what" of learning. In the previous example, students were expected to gain an understanding of tenths, hundredths, and thousandths. After some period of initial instruction, it became evident that there was some conceptual confusion on the part of the majority of students. But this conceptual confusion did not result in random responses from the students; they were giving answers that were consistent with what they understood.

With an exclusive focus on breadth of content coverage, the teacher could have continued on—instance after instance. Given a sufficient number of instances and a variety of activities, the students might eventually understand decimals. If instead, the focus is on depth of content coverage, the teacher could go "back to the drawing board" to provide the conceptual basis that was needed for student learning. On the basis of what students did understand, the teacher could help students move from what they *did* understand to what they *should* understand. Armed with an improved understanding of the concept of place value, students could deal with new instances in a more effective way.

Opportunities for Teachers in Small Classes

If the key to successful teaching lies in a proper balance between breadth and depth of content coverage, coupled with a shift in emphasis from the "how" of teaching to the "what" of learning, these classroom observations suggest the following advantages that may be gained by having small classes:

- *Smaller classes allow teachers to shift from management to learning concerns.* This shift enables teachers to be more concerned about managing learning and less concerned about managing learners. The advantage of this shift from personal concerns to student concerns has been recognized in recent years as a positive movement along the continuum of teacher development. As part of this transition, they become more able to see classrooms through their students' eyes rather than their own.
- *Smaller classes allow teachers to better monitor the learning of their students.* In larger classes, because teachers cannot monitor every student, they tend to rely on steering groups to determine how things are going, whereas in smaller classes, it is possible to include a greater proportion of the students in the teacher's steering group. For that reason, instructional decisions are made on the basis of a relatively larger number of students, and fewer students are likely to be left behind. Furthermore, the very nature of monitoring changes. In smaller classes, teachers are more likely to diagnose rather than simply to identify difficulties in student learning. Building on what students do know in an attempt to correct what they do not know is a far more promising approach to effective teaching than providing additional details in the hope that something will click in the student's mind.
- *Smaller classes allow teachers to decrease the time spent on review.* If teachers truly know what their students know and do not know, they should be able to spend less time on review. Teachers should be able to conduct reviews on a need-to-know basis. This decrease in time spent on review can enable teachers in small classes to balance breadth and depth of content coverage. Coupled with more adequate and accurate diagnosis of student learning, the amount of time saved allows teachers to stop covering content and begin the process of probing the depths of content coverage needed for many students to learn the material. ⌘

BEST COPY AVAILABLE

Before and After Class Size Reduction:

A Tale of Two Teachers

Cathleen Stasz and Brian Stecher, RAND

Research on class size reduction (CSR) has focused more on student achievement than on the mechanisms that may contribute to that achievement. Thus, it is not yet clear *how* small classes lead to higher achievement. This article adds to the conversation about why class size seems to matter in student learning by taking a close look at two third-grade teachers in California.

This in-depth study is drawn from research conducted over the past 3 years by using both qualitative and quantitative methods to evaluate the effects of the CSR initiative in the state. One strand of this research consisted of in-depth case studies of 16 third-grade teachers during the 2nd and 3rd years of the CSR implementation. In Year 2 of the initiative (1997–1998), 8 of these teachers taught in nonreduced classes and 8 taught in reduced-size classes. This paper focuses on two of these teachers who taught in nonreduced third-grade classes of about 30 students in 1997–1998 but switched to reduced third-grade classes of 20 students in 1998–1999 when their schools implemented third-grade CSR.

From previous research and hypotheses about how a smaller classroom environment might mediate improvements in student achievement, the following questions were examined:

1. Does the change from large to small classes alter the organization or structure of mathematics and language-arts lessons? Do the types of activities change?

2. Do teachers alter specific teaching techniques or practices, such as providing more individual attention to students or grouping them differently for purposes of instruction? Do their methods appear effective?

3. Is there any difference in the cognitive level or content of the material presented to students? Are the lessons and assignments generally grade appropriate? How demanding are the assignments?

4. Do the classes run more smoothly and make better use of available school time? Are transitions smoother? Are students less disruptive and more on task? Do teacher's management strategies differ?

5. Are teachers' attitudes or views about teaching any different? What value do they see in teaching in a smaller class?

A Closeup Study of Two Classrooms

Ms. King's class was in Vanguard School, east of Los Angeles. The student population is primarily Hispanic (55%) and Caucasian (22%); about 44% of students participate in a free or reduced-price lunch program. Sixteen percent of Vanguard's students are classified as English Language Learners (ELL). During the first year of the study, it had reduced first and second but not third grade. Ms. King's nonreduced class had 30 students. Now all K–3 grades have been reduced and average about 20 students. In 1998–1999 Ms. King had an aide in her classroom for about 30 minutes a day to help with students reading below grade level. She followed the district math curriculum framework, which is based on the state framework, and used the state and district frameworks in her language-arts curriculum. At the end of third grade, she wanted students to be able to write in paragraphs and to read and comprehend at grade level. However, she felt that about a third of her students were not prepared for third-grade work.

Ms. Lane's class is at Stringfield School, located in southern Los Angeles County. It is a large K–5 school with just over 1,000 students. The student population is primarily Hispanic (53%) and African American (24%). About 86% of Stringfield students participate in a free or reduced-price lunch program, and about 49% are designated as ELL. The average class size in K–3 is 19 students. In 1998–1999, Ms. Lane had a noninstructional aide in her class about 6 hours per week, but the aide also helped tutor individual children in reading. Ms. Lane had followed the district mathematics curriculum standards for about 3 years. In her opinion, most of her students were unprepared for third-grade math.

Summary Findings

This close-up view of two teachers who switched from nonreduced to reduced-size classes admittedly covers only a small sample of these teachers' instructional practices. To address the questions that guided this study, several aspects of Ms. King's and Ms. Lane's teaching are summarized, and some comparisons are drawn to previous studies of teaching in smaller classes.

LESSON STRUCTURE AND ACTIVITIES

The overall structure of the lessons and the activities within them did not differ much from Year 1 to Year 2, despite the change in class size. Both teachers seemed to increase the number of activities carried out within their lessons, especially during mathematics lessons. This pattern mirrors what was found in the Year 1 comparison of teachers in reduced-size and nonreduced classes: Teachers in reduced classes reported doing more than teachers in larger classes. As in some earlier studies, teachers observed in this study generally spent more time teaching language arts than mathematics, irrespective of class size.

BEST COPY AVAILABLE

Teaching Techniques

There was little overall difference in teaching practices from Year 1 to Year 2. Ms. Lane's practices seemed especially robust from year to year, following the "exposition, guided practice, individual work, summary" model. Unlike most teachers who participated in the case studies, Ms. Lane did not regularly group students for instruction or work with them on an individual basis. She did not change her grouping practices at all when she worked in a reduced class, preferring to teach to the whole class irrespective of class size. Ms. King, on the other hand, reported using more groups in mathematics when students had difficulties, but this practice did not change from Year 1 to Year 2. Similarly, her grouping practices in language arts looked similar from year to year. She typically worked with one group of students for most of the time period, while other groups did individual seatwork or worked with an aide. Overall, these two teachers still favor the whole-class approach over grouping strategies.

These teachers did not shift toward more individualized instruction even after they moved to smaller classes. Ms. Lane did work with individual students, but for the exclusive purpose of carrying out the district's benchmark assessments. Neither teacher seemed to do an especially thorough job of monitoring students' learning during the lessons except when they adopted a guided-practice strategy of working problems one by one. It may be that these teachers' tendency to teach to the whole class made it particularly difficult to switch to more individually based instruction despite the opportunity provided by the reduced-size class. It may also be that these teachers just lacked experience individualizing instruction.

The content of the mathematics lessons did not appear to change significantly for either teacher. They stayed fairly closely to the topics intended for third grade or for earlier grades. These findings are similar to the results of the larger state study that showed teachers in nonreduced and reduced-size classes covering the same general topics in mathematics and in language arts and for similar amounts of time. It is possible that the similarity in the breadth and depth of topic coverage reflects the influence of the state curriculum guidelines.

Classroom Management

A few changes in classroom management were evident as teachers moved from nonreduced to reduced-size classes. Ms. King's reduced class, in particular, seemed quite different, primarily because she did not "quiet" students all the time. Ms. Lane was still clearly in control of the action in her classroom, but she also seemed to provide more positive feedback to students in her reduced-size class. In both cases, the amount of time and energy devoted to discipline, order, and transitions declined with the small class—a finding that has also been noted in previous work.

Perceptions of Teaching and Learning

Teachers' expectations regarding CSR were not borne out when they actually had smaller classes. Both anticipated substantial changes, but they found things were much the same. Neither teacher seemed to take advantage of the opportunity to individualize instruction when teaching fewer students. It is possible that their expectations were not met because of their existing attitudes. Both teachers seemed to emphasize student ability as the primary determinant of success. Perhaps these teachers did not view CSR as an opportunity for *them* to change. As a result, they may have adopted a somewhat passive role in the change process and were not actively thinking about what they might do differently.

Although student achievement data were not available to measure actual changes in students' achievement, the teaching observed in this study did not appear to be very effective. For example, with regard to the two teachers' lesson management, in both sizes of class they worked at a very slow pace and had unclear goals. These teachers showed little individualization and also did not routinely monitor students learning, diagnose problems, or provide feedback.

For these two teachers, class-size reduction did not lead to dramatic improvements in teaching. Analyses of the case-study teachers and 2 years of survey data from several hundred third-grade teachers show only a few small differences in instructional practices between nonreduced and reduced-size classrooms. The few differences noted, however, are encouraging and should not be discounted. CSR has positively affected most teachers' perceptions: They overwhelmingly report that smaller classes provide opportunities for more individual contact between students and teachers.

The findings reported here and in other studies are fairly consistent with the limited research literature on teaching behaviors and class size. Teachers in small classes continued to use teacher-oriented, teacher-controlled teaching, although they were more likely to individualize instruction through one-on-one interaction with students. This study's findings are also consistent with research that suggests teaching practice is resistant to change and that teachers adapt their practices slowing and marginally as new materials and techniques are introduced. Teachers may need to be trained in instructional techniques that are effective in smaller classes and perhaps also in their attitudes about what factors may influence student learning. ⌘

BEST COPY AVAILABLE

Class Size Reduction and Special Education Referrals and Placements

Edward Wiley, Thomas Parrish, and George Bohrnstedt, American Institutes for Research

Class size reduction (CSR) is increasingly popular as an educational reform, and California is at the vanguard of this effort. In 1996, California initiated a statewide reform to reduce classes in Grades K–3 in its public elementary schools. One potential outcome of the California CSR initiative is a change in the number of children placed in special education programs. Some analysts believe that teachers in smaller classes may be better able to identify students needing special services and that this will bring about an increase in special education referrals and placements. Others, however, feel that smaller classes would better allow for mainstreaming, thereby reducing referrals and placements.

Concerns about the effect of CSR on special education students were expressed in a recently filed complaint with the U.S. Department of Education Office for Civil Rights against the California Department of Education. The complaint alleged that students with disabilities are not allowed to benefit from CSR to the same extent as their nondisabled peers. One of the consequences of the CSR initiative is that it is sometimes more convenient to return students with disabilities to what are called "special day classes" in order to maintain reduced-class sizes in the general education classes. California CSR provisions strictly require that there be no more than 20 students in a single general education class, and although in the past special day classes have had a target of 12 students, size standards for special day classes are not tightly specified.

A related concern is the misplacement of students in special day classes. Under California's CSR and special education funding provisions, districts may actually have a fiscal incentive for such misplacements. For example, a school whose reduced-size classes in Grades K–3 are all at the maximum of 20 students may contain classes with students who have been mainstreamed. In addition, the school's special day classes may already be at the target capacity of 12 students. When an additional nondisabled K–3 pupil is assigned to this school, the school has to decide where to put that student. He or she could be added to one of the CSR classes, but that would mean losing CSR funds, because class size would grow to more than 20 students. Another option could be for the school to hire an additional teacher, which would allow all of these classes to decline substantially in size but would also increase costs. Moreover, as a final option, the school could reassign one of the mainstreamed special education students to a special day class. This reassignment would increase the number of students in the special day class to 13 but would avoid the negative financial implications of losing a CSR class or hiring another teacher.

In response to these concerns, the California Department of Education took steps to alleviate the following problems: (a) the disparity in the resources made available for students who are enrolled in special day classes; (b) the increased overcrowding in special day classes; (c) the misplacement of students in special day classes; (d) the increase in the number of unqualified teachers who are serving special education programs; and (e) the assignment of special education programs to inappropriate facilities. This disparity, however, is likely to continue to raise questions about the impact of CSRs on special education students and warrants further monitoring of the effects of CSR on special education students.

CSR Evaluation Studies: The Impact on Special Education

Since the inception of the CSR reform in California, staff at the American Institutes for Research have conducted yearly evaluation studies of the initiative. As part of the Year 2 evaluation, investigators sought to answer the following questions concerning the impact of CSR on special education:

- How have rates of special education referral and identification and special day class placement changed in the years since statewide implementation of the CSR reform?
- How did the CSR reform affect recruitment and hiring of teachers with special education credentials?
- How was the morale of special education teachers affected by the CSR reform?
- Did teachers holding special education credentials move to general education assignments with the introduction of CSR?

The results reported are based on quantitative analyses of state archival data, survey data collected as part of the study, and an analysis of interviews with officials from a sample of urban districts in

BEST COPY AVAILABLE

California. Quantitative data from a number of sources have been used to describe changes in the identification of students needing special education services as well as changes in trends in the distribution of teachers with specialized credentials. These findings are primarily based on analyses of teacher- and school-level data derived from the California Basic Education Data System as well as student-level special education records that were provided by the California Special Education Management Information System.

As part of the work during the first year of the CSR evaluation, surveys were administered in 1998 to 125 of California's 1,054 district superintendents and to 625 of California's school principals. Data from the CSR district and principal surveys were used to address questions about the ease of hiring teachers with special credentials and about the flow of special education teachers to general education classes. The interview findings were derived from a qualitative case study that was conducted with six large urban school districts in California. Within each district, the superintendent and the director for special education programs were interviewed.

In interpretation of the results of the interviews, it is important to keep in mind that they reflect a very small sample of districts and respondents. With respect to student demographics and characteristics of school districts, the six districts do not constitute a representative sample of all California districts; sampled districts were purposively chosen to be large, urban districts with high percentages of English learners and minority students. Although the data illustrate some of the problems districts encountered for their special education students when implementing CSR, any generalizations based on these results must be made with caution.

Research Findings

Some of the most important findings from the examination of how CSR might have affected special education and English-learner students are as follows:

- Interviewees contacted in six large districts suggested that the number of students who are *referred* for special education assessment increased with CSR. Factors that may account for this increase include more time for teachers to provide individualized attention; lack of training among teachers on how to provide individualized attention to students in smaller classes (and therefore inappropriate referral for special education assessment); an increased focus on school accountability concurrent with the implementation of CSR; and the CSR-inspired districtwide adoption of creative programs for identifying and addressing the needs of special education students.
- Although the special education referral rate appears to have increased with CSR, the statewide quantitative data suggest that the percentage of students actually *identified* as needing special education services was unaffected by the reform.
- CSR policy imposes a strict class-size limit, whereas the state's special education policies do not. Given that CSR funding is tied to the class-size restriction, some districts, as indicated above, may see a fiscal incentive associated with keeping class size down by assigning special education students to full-time special education classes (i.e., special day classes) rather than mainstreaming them. This concern was included in the complaint filed with the Office of Civil Rights and was raised by some interview respondents. However, statewide data show no increase in the percentage of students in special day classes since CSR was introduced.
- District staff reported that CSR exacerbated an already-existing shortage of qualified substitute special education teachers.
- Interviewees reported a decline in the morale of special education teachers with CSR implementation.
- Districts reported that hiring teachers qualified to serve special education children was difficult and that this difficulty was significantly worsened by CSR. District survey data indicate that this situation was exacerbated by the flow of credentialed special education teachers to general education classes.

The overall policy recommendation that arises from these analyses is that the effects of California's CSR program on special education students need to be more specifically considered. CSR was implemented very quickly in the state, and that may have brought unintended, negative consequences to the state's special education students. The main lesson arising from the evaluation of CSR reform in California is that attention should be paid to the many possible outcomes of implementing CSR—or of any educational reform—before choosing a timeline for its implementation and a scope for enacting it. ⌘

BEST COPY AVAILABLE

Teaching Reduced-Size Classes:

Lessons For Teachers

John Zahorik, Alex Molnar, Karen Ehrle, and Anke Halbach, University of Wisconsin–Milwaukee

This study, supported by the North Central Regional Educational Laboratory (NCREL), was conducted as part of the evaluation of the Student Achievement Guarantee in Education (SAGE) program to investigate how teachers of reduced-size classes spend their newly acquired extra time.

SAGE was established in 1995 to promote academic achievement of students in kindergarten through third-grade classrooms in selected Wisconsin schools serving low-income children. In exchange for $2,000 from the Wisconsin Department of Public Instruction for each low income student, schools were required to (a) reduce the student–teacher ratio within a classroom to 15 students per teacher beginning with kindergarten and first grade in 1996–1997, adding second grade in 1997–1998, and then adding third grade in 1998–1999; (b) establish "lighted schoolhouses" open from early morning until late in the evening; (c) develop a rigorous curriculum; and (d) create a system of staff development and professional accountability. Originally SAGE consisted of 30 schools in 21 districts throughout the state. As a result of two expansions of the program, SAGE classrooms can now be found in 566 schools.

A longitudinal evaluation of the SAGE program begun during the first year of program implementation has focused on two general areas: (a) the effects of the program on student academic achievement in reading, language arts, and mathematics at the first, second, and third grade levels; and (b) the classroom events resulting from reducing class size to a 15:1 student–teacher ratio that may account for any program effects on student learning.

To determine the effect of SAGE student–teacher class reduction on student achievement, SAGE classes were compared with classes from a set of comparison schools in SAGE participating districts that were similar in terms of race, income, and other factors, but had normal class sizes. Achievement was measured with the Comprehensive Test of Basic Skills (CTBS) Complete Battery, Terra Nova edition, at each grade level. The results from 1996–2000 show that at the first-grade level, when adjusted for pretest scores, SAGE students scored significantly higher on posttests in reading, language arts, mathematics, and total score than did first-grade students in comparison schools. Second-and third-grade test scores show that the achievement advantage of SAGE students over comparison students was maintained and, in most cases, increased in second and third grade.

The main effect of having fewer students is that teachers individualize their instruction. The content of instruction is uniform, but the teaching procedures vary with the student. This increased use of individualization in reduced-size classes is a result of increased knowledge of students; less discipline, which makes more time available for instruction; and greater teacher enthusiasm. The individualization that is produced, along with an increased use of hands-on activities that these three elements also enable, results in deeper and increased content, in more student self-direction, and ultimately in greater student achievement.

Effective Reduced Class-Size Teaching

As a result of the SAGE evaluation and other research, the general instructional characteristics of reduced class-size teaching are known. However, what more effective reduced class-size teachers do in their classrooms in comparison to less effective reduced class-size teachers is not known. The purpose of the current study was to compare the teaching behavior used by a group of more effective, reduced class-size, first-grade SAGE teachers with the teaching behavior used by a group of less effective, reduced class-size, first-grade SAGE teachers by the use of qualitative research procedures.

The teachers for this study were first-grade teachers or teacher teams who participated in the SAGE program for a minimum of two years. Researchers identified teachers or teacher teams who had comparatively higher than expected achievement gain scores for each of the two years (Group A) and teachers or teacher teams who had comparatively lower than expected achievement gain scores for each of the two years (Group B).

Each teacher was observed a minimum of 4 times in reading and math instruction. The observation guide focused attention on (a) general aspects of teaching, such as objectives, learning activities, teacher and student behavior, and class organization; and (b) on teacher behaviors found to be related to reduced class-size teaching from our previous research such as individualization, discipline, hands-on activities, and instructional time.

Three formal interviews were conducted with each teacher: an introductory interview, a reading interview, and a mathematics interview. Teachers were also asked to complete a self-report regarding their instructional techniques.

The general pattern of teaching found to be associated with teaching reduced-size classes was evident in varying degrees in both the higher achieving classrooms and the lower achieving classrooms. All of the teachers emphasized individualization to some degree. However, Group A classrooms differed from Group B classrooms in instructional orientation, in management, and in individualization.

Group B teachers have goals that emphasize students' personal development and stress methods that facilitate independent, experiential learning. These preferences result in a less central role for the teacher and less emphasis on the basic skills and concepts of reading and mathematics in comparison to Group A teachers. Group B teachers have student management procedures that are tolerant and permissive and lesson management practices that evolve and develop. These practices are time-consuming and result in less time available to devote to academic, goal-directed instruction in comparison to Group A teachers. Although Group B teachers use individualization in their reduced-size classes, because of their attitude toward the active teaching of basics and the limited time available for instruction in their classrooms, their individualization is less teacher-directed and basics-oriented than that of Group A teachers.

Group A teachers have more balanced goals that include attention to personal development, but they emphasize the goals of basic skills and concepts. The methods that they prefer are those associated with explicit teaching, such as explaining, modeling, checking, and evaluating. These goals and methods result in more active teaching of the basics in comparison to Group B teachers.

It should be noted that although the teaching methods of Group B teachers jeopardize achievement as measured by standardized tests, over time the goals and methods of the Group B teachers may not be harmful and may indeed be helpful. If the goals of thinking and problem solving are realized, students will be well served in the future even though the attainment of basics is delayed.

Recommendations for Teachers

The results of this study, although tentative because of the limited sample size and the examination of only one grade level, have possible implications for staff development in reduced class-size schools. Improved teaching and learning occurs in most first-grade classrooms when class size is reduced to about 15 students. It is not unreasonable to speculate that even the teaching of less effective teachers improves as they move from a larger class to a smaller class. The results of this study suggest that teachers of reduced-size classes could benefit students' learning to a much greater degree if the teachers adopted the mindset and methodology of the most successful reduced class-size teachers.

Reduced class-size teachers need to realize that the extra time afforded by having a reduced class size provides them with an opportunity to do everything in their power to improve academic achievement. Personal and social goals are important and need to be part of a balanced curriculum, but they cannot be permitted to dominate instruction. If they consume the extra time, the value of reducing class size will be diminished. The notion of providing students more freedom and voice in the classroom in choosing activities, identifying content goals, working in groups, and engaging in other self-directed activities that reduced class size permits is appealing. But the practice of a teacher moving to the side and putting the student on center stage is a risk unless it is done in an unambiguous context of basic skills and knowledge achievement.

Reducing class size results in more time for instruction, but the teacher's management methods can expand or shrink that time. When teachers are overly permissive and nonassertive in an attempt to implement student self-discipline in their family-like small classes, misbehavior often emerges and instructional time is lost. A structured, consistent student-management program in which the teacher is decisive, firm, and fair is needed just as much in a reduced-size class as it is in a regular-size class.

To maximize available time, teachers also need to carefully organize their lessons. Although some fluidity in lessons is desirable, time is lost if the teacher's lessons are not clearly organized at the start. The teachers need to be sure about what they want students to know or be able to do at the end of the lesson, to identify and carefully sequence learning activities that can lead to the achievement of goals, and to assemble the materials and resources that are to be used. The lesson as implemented should proceed in a logical order and at a brisk pace.

The type of individualization that reduced class-size teachers ought to use is individualization of process. The specific elements of individualization that seem to account for the success of reduced class-size teaching in promoting student learning are articulation and critique. Teachers of reduced-size classes need to fill their newly acquired time with constant requests to students to share their knowledge and with constant feedback to students regarding the knowledge that is shared. ⌘

The Varieties of Small Classes and Their Outcomes

Charles M. Achilles, Eastern Michigan University; and Jeremy D. Finn, State University of New York at Buffalo

This article reviews the research regarding student outcomes under different class-size reduction (CSR) arrangements and compares the evidence on pupil–teacher ratio (PTR) to that on class size (CS). Is there a knowledge base from which to draw conclusions about these different classroom organizations? Is there evidence on PTR and CS from which inferences may be drawn about their respective influence on pupil learning? What experiences have teachers reported when teaching under these different models? Does research provide a set of principles that would explain why the different models or "varieties" are more or less effective?

Except for a daylong small class in which one teacher is responsible for the students, most varieties described in the research are *not* small classes; they are PTR options. The *class size* is the number of students in a class. *If 30 students are in a room with one teacher, the CS is 30; if two teachers are with that class, the CS is 30, but the PTR is 15:1. If four teachers provide services to the 30-student class, the class size is still 30.* This persistent confusion between the terms CS and PTR and their underlying concepts robs children of excellence in education and mocks serious research on CS and its relation to academic performance. When the terms are used precisely, research on CS and research on PTR can be compared and contrasted.

Nationally, the difference between the average CS and PTR is about n = 10. In a district in which the PTR is 17:1, most teachers will have class sizes of about 27. This reasonably large difference aside, processes in a small class are dramatically different from those of large classes with small PTRs.

If the two terms—PTR and CS—are not the same, why would they be used interchangeably? To say that PTR and CS "vary together" so they can be substituted for one another is to miss the point of what the two terms mean. Height and weight also vary together but cannot be interchanged.

Meta-analyses in the late 1970s triggered a modern-day round of interest and activity in class-size research and practice. Prime Time in Indiana and the DuPont Study in Tennessee preceded Project STAR, a longitudinal, statewide, randomized experiment to determine the effects of small classes (about 13–17 pupils per class) on student achievement and development in primary grades (K–3). The STAR study and its large databases made possible later analyses to answer questions regarding long-term results from early small-class participation. Students in small (S) classes (13–17 students) performed better on both norm-referenced tests (NRTs) and criterion-referenced tests (CRTs) than did the randomly assigned students in regular (R) (22–25 students) and regular-with-aide (RA) classes. This was true for each year from kindergarten through third grade.

Although the research leads to an inescapable conclusion that small classes cause improved student performance, educators are still trying to learn *why* students excel in small classes. Despite our incomplete understanding of classroom processes, Project STAR, Project Challenge, and analyses of student outcomes after students left STAR following third grade have all helped define "correct" ways to implement reduced-size classes to maximize the positive and enduring effects of small classes in the early grades.

The Varieties of Small Classes

Varieties in employing class-size strategies are more like PTR than CS, and without precise attention to the number of students in a class and study of the instructional processes, it is impossible to determine exactly if a reported variety is related to CS or PTR. Sometimes groups contemplating using CS ideas confuse PTR and CS in their discussions. Evaluation of the Buffalo CSR revealed a number of instructional models in use:

- *New small classes* had 20 or fewer students taught by one teacher. The classes were created and the teachers hired specifically for the CSR project.
- *Existing small classes* had 20 or fewer students taught by one teacher. These classes existed before the implementation of the CSR project but had enrollments greater than 20 students then. When students were removed from these classes to create new classes, the enrollments dropped to below 20.
- *Team-taught classes* had two full-time teachers sharing responsibility for one class of students, usually with a relatively large number of students.
- *Push-in or pull-out classes* were characterized by a teacher rotating between or among two, three, or more classrooms throughout the day, usually working with small groups of students. A push-in teacher usually worked in a corner of

BEST COPY AVAILABLE

the classroom, whereas a pull-out teacher removed students from the regular classroom to work with them in the hall or a spare room.

Outcomes for the "Varieties" of Small Classes

Although discussed as a reduced class-size project, much of Indiana's Prime Time actually manipulated PTRs. Prime Time demonstrated that class-size benefits could not be reproduced by using a full-time teacher aide, something also shown in STAR. Adding an aide to a classroom reduces the PTR but does not lower the actual class size. Prime Time had mixed achievement outcomes, although surveys of teachers and principals generally provided positive responses.

The California CSR effort was hastily implemented in grades K–3 statewide in 1996. The size of the CSR effort did not allow evaluators to determine the actual class sizes across the state. Evaluations showed slightly more positive student test-score outcomes for students in CSR schools, but early gains were about what is obtained in PTR efforts. The real test will be when the students who started school in kindergarten in small classes take the third-grade test.

In Wisconsin's Project SAGE, there were some "pure" CS examples of reduced-size classes and some varieties that manipulated PTRs without reducing class sizes. Title I programs often reduce PTRs through adding aides and teaching staff to larger classes. Evaluations of Title I have provided outcomes for that variety of small class, but to date, they have not shown glowing effects.

Class-Size Outcomes

Although results from varieties of small classes are still ambiguous, results from true CSR initiatives are consistent and positive for student outcomes (achievement, behavior, participation) both in the long term and in the short term, as well as for teachers.

Based on studies of such programs as Wisconsin's SAGE, the following list summarizes teachers' comments about working in reduced-size classrooms:

- Teachers employ a wider variety of instructional strategies, methods, and learning activities and are more effective with them.
- Teacher attitudes and morale are more positive.
- Classroom management and discipline are better.
- Students benefit from more individualized instruction.
- Students develop better human relations and have greater regard for others.
- Students learn the basic skills better and master more subject matter.
- Students engage in more creative and divergent thinking processes.
- Students learn how to function more effectively as members and leaders of groups of varying sizes and purposes.
- Student participation and interaction improve.

How Does Class Size Work?

Research in small classes consistently shows that there are "correct" ways to implement CSR, which produce positive benefits for students:

- Start the pupil in the small class when he or she starts school (Pre-K or K).
- Avoid PTR-like events, such as pull-outs. The class should be kept together with the teacher.
- Maintain the small class (15–18 to 1) for at least 3 years, or preferably 4.
- Organize small classes so they have a typical cross section of students in the school.
- Phase out "projects" as small-class benefits grow.
- Carefully analyze personnel assignment and use.

Recommendations for Future Research on Class Size

The summary of research suggests the following recommendations for future research and evaluation that will keep clear the fundamental distinction between reducing the class size and reducing the pupil–teacher ratio.

- Class size and PTR are not the same, so they should not be confounded and reported as the same.
- For clarity and precision, research should contain clear definitions of computation and determination of the variables so that CS and PTR are kept distinct.
- Research efforts on both CS and PTR are useful. Research and evaluation on both should continue, separately.
- A concerted effort should be undertaken to educate the public, parents, researchers, policymakers, and the media on the differences between PTR and CS.
- Some "ideal" CS implementations need to be studied and evaluated to establish a substantial base of CSR data in which the event described is really a reduced-size class.
- State and federal agencies must advocate correct CS implementation through staff development and program guidelines. Agency documents and information on PTR and CS should both define and use the terms explicitly. ⌘

Building a Communication/Dissemination Network to Support Class Size Reduction

Monica R. Martinez, Institute for Educational Leadership; and Carmen G. Arroyo, Health and Education/Research Alliance

Though class size reduction (CSR) clearly benefits teaching and learning, so far this reform has not been widely adopted. CSR promoters agree that more effective dissemination of knowledge on small classes' benefits is needed to advance implementation of CSR policy and practice. This paper sketches a framework for developing an information-dissemination network for CSR. Suggestions are given for increasing awareness and practical knowledge of CSR among educators, policymakers, and the wider community and for changing attitudes toward the reform. It is also argued that a CSR dissemination network must target its audiences and messages, use technology to organize information, and provide personal communication channels.

Raising Awareness

An effective dissemination network must increase awareness and "how-to" knowledge of CSR. While awareness includes research on CSR effects, policies, and perceptions, how-to knowledge provides specific guidelines for implementing CSR practices. Awareness can be crucial in laying groundwork for wider implementation, but the considerable research on the reform remains largely unknown among key stakeholders.

One way to increase awareness of CSR would entail developing a national network of stakeholders, uniting researchers, administrators, teachers, and parents to gain awareness of existing research and practice and to share experiences. Many state education departments, teacher unions, and school districts with detailed information on CSR efforts and effects are currently isolated. However, if connected nationally, they could develop awareness of the implications of CSR for fiscal allocation, school and classroom management, teacher hiring, and student achievement Successful models for raising awareness have used accessible research analyses, focused messages, and varied methods for engaging constituents.

Increasing How-to Knowledge

CSR research, though widely disseminated through scholarly publications, must be translated into practical knowledge to show decision makers and practitioners how to reduce class size effectively. The complexity of the research makes it difficult to communicate findings in practical formats that can have direct and immediate influence.

CSR advocates can capture how-to knowledge by serving as information brokers for policymakers and practitioners. Information brokerage has been practiced effectively in other reform efforts by linking community leaders to the best research and practices through newsletters, consulting, and national conferences that bridge the gap between community leaders and the best research and practices. Although no national brokerage exists for CSR, one urban, CSR-related collaboration performs brokerage by bringing together teachers with differing knowledge and experience to share how-to knowledge. Such work could be extended nationwide by developing mechanisms for bringing together constituents with varying expertise to develop small-class strategies and guidelines for direct implementation. Further, online discussion groups could be established between researchers and practitioners and between schools involved in reform, providing website visitors with applicable knowledge of what works to reform schools.

Changing Attitudes

Well-established attitudes about a policy influence the speed, accuracy, and degree of approval with which people react to new information about it. While such attitudes help people notice and process new data, they are difficult to change; new knowledge leads less to replacing old attitudes than simply to modifying them. Thus, CSR endorsement is likely to depend on previous knowledge and approval. Established attitudes can also skew CSR research findings. Contentious debate about the economic costs and benefits of reducing class size has demonstrated that equivalent data and analyses can yield different results that seem dependent on predispositions for or against CSR.

Given the established attitudes of education-reform critics against structural changes like CSR and in favor of classroom changes, CSR supporters should not argue for structural reform but instead illustrate that CSR creates classroom improvements. Those disseminating CSR information broadly should also consider the often conflicting attitudes toward school reforms and adapt communicative strategies accordingly.

Targeting the Audience

An effective dissemination strategy for CSR should have goals like those of advertising: to remind, inform, and persuade different audiences through different media. CSR promoters must thus target information to address the chief pedagogical concerns of policymakers and educators and must expect different responses among target groups. The way information on CSR is communicated should vary with the audience. Outreach should differ across state and local levels, geographic regions, and ethnic groups. A primary task for CSR advocates is to analyze audiences thoroughly in order to understand their information needs and preferred methods of communication.

Experience has indicated that dissemination partnerships can help in influencing large and varied target groups. Model partnerships strive to understand the manifold information needs of member organizations and to work within existing structures to reach the greatest number of constituents. Data from diverse sources are integrated, and information is tailored to specific group needs. Class-size reform could benefit from such audience-sensitive collaboration in gathering and distributing knowledge.

Targeting the Message

Further, effective messages about CSR must be targeted to answer audiences' critical questions. To consider in aiming messages at school administrators and practitioners are questions like these:

- Under what conditions does CSR work best to produce student achievement gains?
- How should CSR address teaching quality through hiring practices, space allocations, and instructional strategies?
- For which students does CSR work best?
- For which teachers does CSR best facilitate improvement in instructional strategies?

Only after such questions are specifically answered can effective action be taken. For instance, since it seems that smaller classes work best for low-income and minority students, information helping schools decide how to target CSR efforts at those students could be most useful. Targeted messages must also inform decision makers about influences of other education policies and of fiscal and community needs on CSR implementation. Messages aimed at school districts, for example, must relate CSR to districts' master plans and to other reform efforts, showing how CSR could complement these.

Using Technology

Its many interconnected information sources make the World Wide Web an excellent means of disseminating targeted messages. However, Web information on reducing class size is not integrated as well as that on other policies. The variety of nonintegrated online resources available hampers quick identification of useful knowledge. Since people are most capable of understanding already-integrated information, it seems imperative to develop a comprehensive website for CSR, integrating knowledge and organizing it for different audiences, so that users can decide what information they need. Research has shown that practitioners are most likely to use scholarly information when it is presented as accessible literature reviews or guidelines. A CSR website should develop research summaries and best-practices guidelines that allow teachers to build professional development into daily work. It should also contain tools to help administrators make decisions about implementing CSR at various involvement levels. And like other effective education websites, the site should be free and provide links to full-text documents.

Personalizing the Dissemination Network

Decisions to adopt an innovation depend on sustained interpersonal connections. This suggests that CSR supporters must create interpersonal media for disseminating information. These might include

- professional development workshops and training institutes on CSR for teachers;
- teacher visitor programs;
- conference workshops and presentations on CSR; and
- policy forums on the benefits of reducing class size.

Such outreach and support activities could supplement technology in reaching target groups. Another important aspect of personalizing dissemination should be establishing contacts among those interested in CSR through online discussion groups. In personalizing messages about CSR, advocates should also recognize the influence of opinion leaders. Thus, connections should be created with national education organizations and trusted local education leaders whose authority enables them to effect school and community change. The networking recommended here could help establish such connections, as could the work of a national outreach director.

Conclusion

A carefully designed dissemination network could promote broader CSR implementation, increasing knowledge about the reform while changing attitudes and behaviors of policymakers and practitioners. Knowledge should be disseminated in targeted messages. Existing networking practices model the change-inducing communication strategies that CSR reform needs. To address various audiences' information requirements through appropriate channels is daunting, but it is a challenge that must be met to transform CSR from a limited experiment to a widely adopted reform with benefits available to all students. ⌘

BEST COPY AVAILABLE

Professional Development and Support Needs of Class-Size Reduction Teachers

Gina M. Pannozzo and Jeremy D. Finn, State University of New York at Buffalo

The movement toward small classes has created a great increase in demand for new teachers, which has significantly affected professional development (PD) needs. Many teachers being placed in elementary classrooms are new to teaching and to their schools. Also, many veteran teachers are transferring from other settings to small classrooms. The instructional practices that may be ingrained from years of experience in those settings are not always current "best practice." Programs for PD can help both new and veteran teachers enhance the benefits of small classes by taking advantage of the opportunities the class size provides.

New Professional-Development Programs

The conditions under which class size reduction (CSR) is being practiced may require four types of support:

- *New Teacher Support.* Teachers hired to staff newly created small classes have often just completed teacher-training programs. The small-class placement may be their first full-time teaching position, allowing them little or no prior classroom experience to draw upon. The support that new teachers receive can determine whether the year will run smoothly and whether the benefits of small classes will be realized.
- *Refresher Courses.* Teachers with substantial experience, either in large classes or other teaching positions, may have developed methods that do not capitalize on the flexibility small classes provides. To maximize the benefits of small classes, experienced teachers may profit from refresher courses in the basic principles of individualized instruction, assessment of student progress, and addressing individual learning problems with approaches not possible in a class with 30 students.
- *Courses on Nontraditional Classroom Organization.* The small-class movement has motivated districts to establish alternative classroom organizational models, such as team-taught classes and "push-in" or "pull-out" classes as alternatives to self-contained classrooms with one teacher and fewer than 20 pupils.
- *Courses on Experimental Programs.* Experimental programs of professional development can encourage teachers to explore the range of opportunities that small classes permit, perhaps enhancing pupils' learning and learning-related behavior.

Principles of Effective Professional Development

Much of the research identifying general principles of effective PD is summarized in a 1998 Organisation for Economic Co-operation and Development report, "Staying Ahead: In-service Training and Teacher Professional Development." The report recommends that PD activity

- be connected to other aspects of school change;
- be consistent with the needs of teachers in the settings in which they teach;
- include information about why it is important, what it will accomplish, and how it should be implemented correctly;
- be connected to teachers' current practices and instructional styles and demonstrate how those practices should be modified to attain desired objectives; and
- be sustained and ongoing within the real-life context of the classroom.

School administrators must be active in implementing and sustaining PD activity in their schools. Principals can learn to observe, evaluate, and provide feedback to teachers so they come to be viewed as partners in what happens in the classroom.

Development and Support Needs of CSR Teachers

New teachers or those new to the small-class setting are likely to need two kinds of assistance: training in the use of classroom strategies shown to be effective and support in becoming acculturated to the school environment. Both of these supports can have a direct impact on their classroom functioning. Evaluation of the Buffalo CSR program identified three domains of classroom strategies in which small-class teachers may require assistance.

Approaches to Improving Instruction and Achievement

This refers specifically to improving teachers' capacities to engage students actively in the learning process and to encourage them to become independent learners. Instructional strategies include small-group instruction, cooperative learning, scaffolding, and strategies that emphasize problem solving and higher order thinking skills. Professional-development programs can hone teachers' sensitivity to individual learning problems and increase their skills in working with lower achieving students. Both veteran and novice teachers can benefit from PD targeted at improving instruction and achievement. Veteran teachers, while they may have used these techniques in teaching larger classes, may need to reframe them for effective use in smaller classes. Novice teachers, while they may be familiar with some of the techniques in theory, can benefit from workshops to help put them into practice.

ESTABLISHMENT OF A PRODUCTIVE CLASSROOM ENVIRONMENT

This refers to improving teachers' capacities to structure an orderly classroom environment where the learning process is valued and where students receive respect and support from each other and from the teacher. It involves effective use of the classroom space, use of effective behavior management techniques, and a focus on teacher–student and student–student relationships. Small classes provide real advantages in this domain. Veteran teachers may have developed good skills in this domain but could not practice them because of larger class sizes; professional development allows them to rediscover these skills and learn new ones. For novices, the greatest struggle is often developing effective methods of managing disruptive behavior. Targeted PD can help them learn more effective behavior management techniques so they feel less overwhelmed by disruptions.

EFFECTIVE ASSESSMENT OF PUPIL LEARNING

Focused PD in the domain of effective assessment strategies can enhance teachers' skills in evaluating student performance, with the objective of guiding instruction. It should include basic principles of achievement testing and the appropriate use of techniques like portfolio and performance assessment. These approaches reflect and encourage teaching and learning at higher cognitive levels. Teachers of small classes have greater opportunity to use a variety of assessment techniques. Small classes offer teachers the time to monitor student progress continually and make it more practical to employ hands-on activities. In this area, novice teachers are likely to be more familiar with alternate forms of assessment than some veterans, if these topics were emphasized in teacher-education programs.

PROFESSIONAL SUPPORT FOR CSR TEACHERS

Teachers participating in a new initiative need information about the program itself, their roles, and the expected outcomes. Such support can be provided through practices orienting teachers to the program and keeping them continually informed. Without this information, teachers may feel disenfranchised and work with only a vague sense of purpose. With it, they may experience more commitment to their jobs and to the program, whether it is CSR or some other initiative.

New teachers may need assistance adjusting to the school environment and the "nuts and bolts" of teaching. This may seem a minor issue, but teachers can be incapacitated without basic information about daily schedules, classroom routines, finding classroom supplies, accomplishing simple clerical tasks, or performing expected administrative tasks. Moreover, newly hired teachers often have minimal experience developing lesson plans, organizing classrooms, and controlling pupils with severe behavior problems.

Perhaps the most effective way to support new teachers is through school- or district-level mentoring programs, which involve pairing of experienced teachers with novices for various purposes. In more formal programs, mentors observe and comment on the novice's teaching and may provide opportunities for the novice to observe the mentor as well.

All teachers—but especially new ones—can benefit from exchange of ideas, experiences, and information with colleagues and administrators. It is incumbent on schools undertaking CSR to give teachers opportunities to meet and collaborate with colleagues teaching in the same classroom configuration, to provide regular opportunities for teachers to discuss problems with their colleagues and administrators without fear of retribution, and to receive feedback and recognition from colleagues and administrators alike.

Recommendations

New teachers in CSR programs can benefit especially from focused PD and supportive interactions with their colleagues. The following recommendations are directed to teachers, administrators, and researchers.

- When implementing PD programs, choose carefully. Not all topics and not all workshops are of equal value to all groups of teachers. Choose those most directly related to teaching and classroom management in the settings in which teachers are placed.
- Provide professional support for both novice and experienced teachers placed in small-class settings in order to ensure effective instruction.
- Establish a research program on actual and potential benefits of PD programs for teachers of small classes.
- Ensure that researchers and practitioners concerned with CSR ask what opportunities small classes present to do things differently. ⌘

Students' Sense of Community:

Implications for Class Size

Helen Vrailas Bateman, Vanderbilt University

The American educational system today is faced with a major challenge related to the level of students' academic and cognitive skills. Graduates must compete for jobs requiring a solid foundation in literacy, math, science, writing, and technological skills as well as expertise in critical thinking, reasoning, and decision making. Data from the U.S. Department of Education's National Assessment of Educational Progress indicate that although average proficiency in science, mathematics, and writing in 1992 was slightly higher than in 1988, achievement failed to keep pace with the higher skill level required in a global economy.

Another major challenge relates to the lack of fit between students' developmental needs and traditional school environments. Students in a grade may be in different stages of cognitive and emotional development. Learning and social needs of students in a class may be very diverse because of differences in previous knowledge, skills, and culture.

An additional challenge relates to the lack of social skills and prosocial behavior in our schools. Changes in the structure and cohesiveness of families and communities have left many children with less positive social support and less adult guidance.

These academic and social issues have yielded increased calls for reconceptualizing the student goals, teachers' roles in learning, and the structure and function of learning environments. An area of research addressing some of these issues conceptualizes classrooms as communities of learners. This concept stems from an appreciation of the complex, dynamic interdependence between the student and the classroom as a whole. The classroom community can be examined from multiple perspectives, such as the teachers' and students' senses of community and the classroom characteristics that foster community.

This study examines the classroom community through Seymour Sarason's work on the psychological sense of community—the perception of similarity to others and of acknowledged interdependence.

Psychological Sense of Community in Schools

Sarason argued that the traditional classroom should be restructured to provide students with an environment that nurtures their acquisition and development of academic and social/affective skills. Community-building processes in schools and classrooms are increasingly seen as profoundly affecting students' attitudes about school and learning, their social skills, and their social behavior.

Although their approaches to the sense of community vary somewhat, researchers are increasingly identifying bonding to social environments like schools, which provide norms and skills that oppose high-risk behaviors, as instrumental in increasing students' resiliency. Research indicates that school communities that provide students with a school or classroom sense of belonging, educational engagement, and support are most effective in retaining high-risk youths and are associated with academic motivation, interest, and expectations of success.

Despite the growing interest in community building as a means to improve children's learning environments, very few studies to date have attempted to systematically examine the contribution of learning environments to students' sense of community, the classroom structures and mechanisms promoting that sense of community, the process by which students' sense of community develops, and the relationship of that process to the development of social and academic skills. Important questions remained unanswered: What are the mechanisms through which students' sense of classroom community can increase? What conditions make some classroom communities more effective than others?

Small Class Size Can Facilitate Classroom Community

No research to date has examined the relationship between small class size and students' sense of community. This report explores mechanisms through which class size reduction can facilitate building and sustaining classroom community.

Membership in the Classroom Community

The key to feelings of belonging in a community is the level of personal investment in the community processes. The harder one works and the more resources one invests, the more valuable and meaningful community membership becomes. In the learning-community classroom, all students participate in a rigorous learning process that continuously challenges them by requiring deep levels of inquiry. Students must use active, strategic learning, reflect on their learning, and monitor comprehension. They must invest considerable effort in acquiring expertise in different areas of research throughout the year.

Evidence indicates that small class size can powerfully promote students' membership in the classroom by making them more active and frequent participants in the learning process. Class-size reduction research indicates that students in small classrooms—especially those of lower ability—get more opportunities to participate actively in classroom processes.

Students in the learning-community classroom are expected to effectively communicate, share, and teach their knowledge to others and to apply knowledge toward the common goals of the classroom. Reduced class size has been associated with increased opportunities for collaboration in groups that are small enough to enable all students to actively participate in each group.

STUDENT INFLUENCE

In the learning-community classroom, every student is an integral part of the learning experience. Through the process of distributed expertise, all students become experts in a domain of knowledge, and their peers depend on them for knowledge and understanding of that area. Conversely, students depend on the rest of the group for their understanding of other areas of expertise. This bidirectional influence bonds each individual to the classroom community.

In small classes, each student gets more individual attention from the teacher and more opportunities to participate in group lessons with fellow students. These increased opportunities can facilitate the development of expertise and academic and social competence for all students in the class, not just a select few.

INTEGRATION AND FULFILLMENT OF NEEDS

In the learning-community classroom, students' learning needs are facilitated and enriched by teachers and peers. The continuous exchange of ideas through various means of discourse allows students to benefit from the common knowledge base and to selectively incorporate the information they feel they need. Research indicates that in small classrooms, students' individual needs can be better met. In addition, in small classes the contributions of individual students toward common goals can become more salient and instrumental, establishing them as valued members in the classroom community. In a small classroom, students have increased opportunities to contribute toward common goals either through the individual work they share with their classmates or through increased participation in small groups.

Moreover, in small classrooms teachers have more time to better address each student's unique learning and social needs. Instruction anchored in authentic problems provides students with relevant and interesting curricula. Students' needs for autonomy, engaging and challenging activities, social support, and a social comfort zone can be better met through the structure and activities facilitated by a small classroom.

SHARED EMOTIONAL CONNECTIONS

As community members share a common history, an emotional bond is gradually created among them. The formation of such bonds can be facilitated by small class size. Research indicates that students in small classrooms report lower levels of antisocial behavior and higher affective evaluations of their peers. Increased collaboration toward common goals in a safe environment should provide students in smaller classrooms with higher levels of shared emotional connection.

Reducing class size is not a panacea for all that ails our classes today. It can, however, act as a facilitator to build and sustain strong classroom communities. The use of the educational practices that have been shown to be effective community-building tools is significantly aided and amplified through the reduction in class size. ⌘

The CEIC
REVIEW

Bonnie Hartman
Mark Rohland
Editors

This publication is supported in part by the Laboratory for Student Success at the Temple University Center for Research in Human Development and Education (CRHDE). The opinions expressed do not necessarily reflect the position of the supporting agencies, and no official endorsement should be inferred.

For more information, write CEIC, Temple University Center for Research in Human Development and Education, 1301 Cecil B. Moore Avenue, Philadelphia, PA 19122-6091, or call (215) 204-3000. Selected CEIC publications and abstracts of articles, including back issues of the CEIC *Review*, are available at http://www.temple.edu/LSS/ceicrevlist.htm

BEST COPY AVAILABLE

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

REPRODUCTION BASIS

☐ This document is covered by a signed "Reproduction Release (Blanket) form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☑ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").

EFF-089 (9/97)